

AEROTECNICA COLTRI®

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USE AND MAINTENANCE MANUAL

MCH-36

High pressure compressor for breathing air and technical gases

MCH-36

HIGH PRESSURE COMPRESSOR FOR BREATHING AIR AND TECHNICAL GASES

IMPORTANT:

**BEFORE USING THE COMPRESSOR READ THIS
MANUAL CAREFULLY**

AEROTECNICA COLTRI® S.R.L.

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Dear Customer,

Thank you for choosing an **AEROTECNICA COLTRI Srl** compressor. This manual is provided together with the compressor to aid you in the use of the machine and ensure that your work produces the best possible results.

Please read all the instructions and information provided on the following pages. Ensure that the manual is at the disposal of the personnel who will be using/managing the compressor and carrying out any maintenance on it.

Should you require any clarification, when using the compressor for the first time or at any other time it is used, please remember that **AEROTECNICA COLTRI Srl** is at your complete disposal.

Should you need to contact us our **fax number** is: **+39 030 9910283**

For routine or unscheduled maintenance note that **AEROTECNICA COLTRI Srl's** international technical service is able to provide you with assistance and spare parts as and when required.

To ensure that your requests are dealt with quickly the following information is provided:

Manufacturer's data: **AEROTECNICA COLTRI S.r.l.**
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DECLARATION CE OF CONFORMITY
Italian DPR 459 of 24th July 1996, appendix II, part A

It is hereby declared that the machine model:

MCH-36

Serial n° _____ year _____

complies with

the provisions of Italian DPR 459/96 as per EEC directives 89/392, 93/44 and 93/68 according to the specifications of the following harmonized standards:

EN 292-1 ('91) - EN 292-2 ('91) - EN 60204-1 ('92) - ISO 3746 - ISO 11202

and also complies with

the provisions of Italian Dlgs 476/92 as per EEC directives 89/336 and 92/31 according to the specifications of the following harmonized industrial environment standards:

EN 50081-2 (August 1993)
EN 50082-2 (March 1995)

DESENZANO DEL GARDA, date _____

**Chairman of the
Board of Directors**

Carlo Coltri



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1 - GENERAL

1.1 - PRELIMINARY INFORMATION

Do not destroy or modify the manual and update it with additional inserts only.

Manual code: 36-10-0001

Revision n°: 00 Edition: 08/2005

Machine type: High pressure compressor for breathing air and/or technical gases

Model: MCH-36

Manufacturer's data: **AEROTECNICA COLTRI S.r.l.**

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1.2 - REQUIRED OPERATOR TRAINING

This manual must be read carefully:

- all compressor operators / maintenance personnel must read this entire manual with due care and attention and observe the instructions/information contained herein.
- employers must ensure that the operator has the required aptitude for operation of the compressor and that he/she has read the manual.

1.3 - IMPORTANT INFORMATION FOR THE USER

The information/instructions for use contained in this manual concern the **AEROTECNICA COLTRI Srl** compressor Mod. **MCH-36** only.

The instruction manual must be read and used as follows:

- read this manual carefully; treat it as an essential part of the compressor;
- the instruction manual must be kept where it can readily be consulted by compressor operators and maintenance staff;
- keep the manual for the working life of the compressor;
- make sure updates are incorporated in the manual;
- make sure the manual is given to other users or subsequent owners in the event of resale;
- keep the manual in good condition and ensure its contents remain undamaged;
- do not remove, tear or re-write any part of the manual for any reason;
- keep the manual protected from damp and heat;
- if the manual is lost or partially damaged and its contents cannot be read it is advisable to request a copy from the manufacturer.

Important: you must understand the following symbols and their meaning. They highlight essential information:

IMPORTANT:

Refers to additional information or suggestions for proper use of the compressor.

DANGER:



Refers to dangerous situations that may occur during use of the compressor: aims to ensure worker safety.

WARNING:



Refers to dangerous situations that may occur during use of the compressor: aims to prevent damage to objects and the compressor itself.

1.4 - FOREWORD

The regulations/instructions for use contained in this manual constitute an essential component of the supplied compressor.

These regulations/instructions are intended for an operator who has already been trained to use this type of compressor. They contain all the information necessary and essential to safety and efficient, proper use of the compressor.

Hurried, incomplete preparation results in improvisation and this often leads to accidents.

Before beginning work, read the following suggestions carefully:

- 1) before using the compressor, gain familiarity with the tasks to be completed and the admissible working position;
- 2) the operator must always have the instruction manual to hand;
- 3) program all work with due care and attention;
- 4) you must have a detailed understanding of where and how the compressor is to be used;
- 5) before starting work make sure that safety devices are working properly and that their use is understood; in the event of any doubts do not use the compressor;
- 6) observe the warnings given in this manual with due care and attention;
- 7) constant and careful preventive maintenance will always ensure a high level of safety when using the compressor. Never postpone repairs and have them carried out by specialised personnel only; use only original spare parts.

1.5 - WARRANTY

IMPORTANT:

The materials supplied by AEROTECNICA COLTRI Srl are covered by a 24-month warranty, the validity of which begins when the compressor is put into service as proven by the delivery document.

AEROTECNICA COLTRI Srl shall repair or replace those parts it acknowledges to be faulty during the warranty period.

In replacing the faulty part AEROTECNICA COLTRI Srl shall not be liable for any other expenses sustained by the dealer or his customer such as presumed damage (present or future), lost earnings or fines.

Routine and unscheduled maintenance must be carried out in compliance with the instructions contained in this manual. Should the required work not be covered by the manual or assistance be required you are advised to contact AEROTECNICA COLTRI Srl directly by fax, even where agreements have already been made on the phone. AEROTECNICA COLTRI Srl cannot be held liable for any delays or failure to execute work.

AEROTECNICA COLTRI Srl cannot be held liable for any damage or malfunctions caused by work carried out on the compressor by unauthorised personnel.

AEROTECNICA COLTRI Srl guarantees that its compressors are free from defects vis-à-vis design, workmanship and the used materials for a period of 24 months starting from the date of delivery of the compressor; should the customer note any flaws and/or defects he must report them, in writing, to AEROTECNICA COLTRI Srl within 8 (eight) days of their discovery otherwise the warranty shall be rendered null and void.

The warranty only covers flaws and faults that occur where the compressor is used properly in compliance with the instructions contained in this manual and where periodic maintenance is carried out.

The warranty does not cover faults caused by improper use of the compressor, exposure to atmospheric agents (rain etc.) or damage during transport; all materials subject to wear and those subject to periodic maintenance are not covered by the warranty and are to be paid for by the customer in full; in any event the warranty is rendered null and void if the compressor is tampered with or if work is carried out on it by personnel who have not been authorised by **AEROTECNICA COLTRI Srl**.

AEROTECNICA COLTRI® S.R.L.

A compressor that has been acknowledged as faulty on account of flaws in design, workmanship or used materials shall be repaired or replaced free of charge by **AEROTECNICA COLTRI Srl** at its plant in San Martino della Battaglia (BRESCIA); costs regarding transport, delivery of spare parts and any materials subject to wear shall be met by the customer.

Should warranty-covered work need to be carried out on the customer's premises, travel and accommodation costs for personnel sent by **AEROTECNICA COLTRI Srl** shall be met by the customer.

The act of taking delivery of machines and/or faulty components or the sending of technicians to assess the presumed defects and/or flaws reported by the customer does not in itself imply acknowledgement that the defect is covered by warranty.

Repairs and/or replacements made by **AEROTECNICA COLTRI Srl** during the warranty period do not in any way prolong the latter itself.

Acknowledgement that a defect is covered by warranty does not in itself mean that **AEROTECNICA COLTRI Srl** is in any way liable to award compensation.

AEROTECNICA COLTRI Srl cannot be held liable for any other direct or indirect damages imputable to compressor defects and flaws (loss of production or earnings etc.) except in cases where serious negligence is demonstrated.

1.6 - ASSISTANCE

AEROTECNICA COLTRI Srl technicians are at your disposal for all routine/unscheduled maintenance work. Please forward your request for assistance to **AEROTECNICA COLTRI Srl** by sending a fax or e-mail to:

Fax. +39 030 9910283

coltrisub@coltrisub.it

1.7 - RESPONSIBILITY

AEROTECNICA COLTRI Srl considers itself exonerated from any responsibility or obligation regarding injury or damage caused by:

- failure to observe the instructions contained in this manual that concern the running, use and maintenance of the compressor;
- violent actions or incorrect manoeuvres during use or maintenance of the compressor;
- modifications made to the compressor without prior written authorisation from **AEROTECNICA COLTRI Srl**;
- incidents beyond the scope of routine, proper use of the compressor.

In any case, should the user impute the incident to a defect of the compressor, he/she must demonstrate that the damage has been a major and direct consequence of this "defect".

WARNING:



Maintenance and repairs must only be carried out using original spare parts. AEROTECNICA COLTRI Srl cannot be held liable for any damages caused by failure to observe this rule. The compressor is guaranteed as per the contractual agreements made at the time of sale. Failure to observe the regulations and instructions for use contained in this manual shall render the warranty null and void.

1.8 - PURPOSE OF THE MACHINE

The compressor mod. MCH-36 has been designed and built for the purpose of obtaining excellent quality breathing air by drawing it from the surrounding environment. The air is free from any harmful fumes. The air is passed through an intake filter and, after the filtration cycle, is stored in bottles constructed to contain air at high pressure.

Any other use is inappropriate: the manufacturer cannot be held liable for any personal injury or damage to objects / the machine itself caused by improper use.

DANGER:



- Use only tested, certified bottles: do not exceed the working pressure indicated on them.
- Aspirate unpolluted air that is not stale.
Use the compressor in areas free from dust, risk of explosion, corrosion and fire.
- It is forbidden to use the compressor with an internal combustion engine indoors.
Make sure that air intakes are a long way from fume exhausts.
- Compressors used on boats can be certified via a R.I.Na (Registro Navale Italiano) test: this should be requested at the time of order.
- Improper use could have serious consequences for the user.
- Do not disconnect the hose from the fittings or the clamp when under pressure.
- Change the air purification filters regularly as described in section "7.11.2 Changing the active carbon filters".
- Drain the condensate regularly as illustrated in section "7.10 Condensate discharge".
- The power lead plug must be disconnected:
 - if there is a problem during use
 - before carrying out any cleaning or maintenance tasks.
- Never pull the plug out by tugging the lead. Make sure the lead is not bent at a sharp angle and that it does not rub against any sharp edges. Use of extensions is advised.
- Never run the compressor when:
 - the power lead is damaged;
 - there is evident damage;
 - the side doors are open.
- All routine and unscheduled maintenance tasks must be carried out with the compressor at standstill, the electrical power supply disconnected and the pumping circuit depressurised.

DANGER:

- After switching off the compressor wait about 30 minutes before carrying out any maintenance tasks so as to prevent burns.
- The high pressure flex hose that connects to the bottle (also called the refill hose) must be in good condition, especially in the areas near the fittings.
The plastic sheath that covers the pipe must not show any signs of abrasion otherwise damp could get in, corrode the steel braid and weaken it.
The hose must be changed periodically (yearly) or when it shows signs of wear. Failure to observe this rule could seriously endanger the users' safety.
Make sure the minimum bending radius of the hose is no less than 250 mm.

To ensure maximum working efficiency, **AEROTECNICA COLTRI Srl** has constructed the compressor with carefully selected components and materials. The compressor is tested prior to delivery. Continued compressor efficiency over time will also depend on proper use and maintenance as per the instructions contained in this manual.

All the components, connections and controls used in its construction have been designed and built to a high degree of safety so as to resist abnormal strain or in any case a strain greater than that indicated in the manual. Materials are of the finest quality; their introduction and storage in the company and their utilisation in the workshop are controlled constantly so as to prevent any damage, deterioration or malfunction.

DANGER:

- Before carrying out any work on the compressor each operator must have a perfect understanding of how the compressor works, know how to use the controls and have read the technical information contained in this manual.
- It is forbidden to use the compressor under conditions / for purposes other than those indicated in this manual and **AEROTECNICA COLTRI Srl** cannot be held liable for breakdowns, problems or accidents caused by failure to observe this rule.
- Check that the fittings provide a proper seal by wetting them with soapy water: eliminate any leaks.
- Do not attempt to repair high pressure hoses by welding them.
- Do not empty the bottles completely, not even during winter storage as this practice prevents damp air getting in.
- It is forbidden to tamper with, alter or modify, even partially, the systems and equipment described in this instruction manual, especially as safety guards and safety symbols are concerned.
- It is also forbidden to carry out work in any way other than that described or to neglect the illustrated safety tasks.
- The safety information and the general information given in this manual are highly important.

1.9 - WHERE THE MACHINE MAY BE USED

The compressor mod. MCH-36 has been designed and built for the purpose of obtaining excellent quality breathing air by drawing it from the surrounding environment, free from any harmful fumes. The air is passed through an intake filter and, after the filtration cycle, is stored in bottles constructed to contain air at high pressure. The compressor must only be used in environments having the characteristics described in the following table.

AREA OF MACHINE USE: ESSENTIAL DATA TABLE

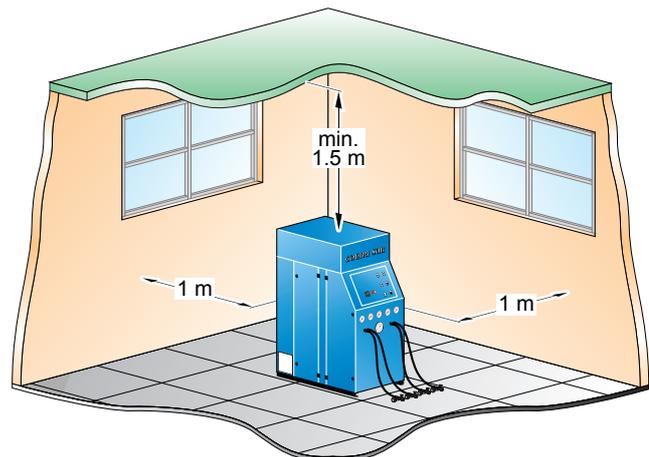
| Characteristic | Unit of measure | Data |
|---------------------------------|-----------------|-----------------------|
| Temperature | (°C) | min. -20° - Max. +45° |
| Air humidity | (%) | max.80% |
| Max admissible wind when in use | (m/s) | max. 15 |
| Tolerated weather conditions | rain | None |
| | hail | |
| | snow | |

Check that the area in which the compressor is to be positioned is adequately ventilated: good air exchange (more than one window) with no dust and no risk of explosion, corrosion or fire.

If ambient temperatures exceed 45°C air conditioning will be required.

Position the compressor no closer than 1 m to surrounding walls; the gap between compressor and ceiling should be at least 1.5 m. These distances ensure proper compressor operation and proper cooling of the pumping unit.

Make sure that lighting in the area is sufficient to identify every detail (such as the writing on the info plates/stickers); use artificial lighting where daylight on its own is insufficient.



1.10 - RUNNING IN AND TESTING THE COMPRESSOR

Each compressor is carefully adjusted and tested prior to delivery.

A new compressor must nevertheless be used with caution during the first 50 working hours so as to complete proper running in of its components.

If the compressor is subject to an excessive workload during initial use, its potential efficiency will be prematurely compromised and functionality soon reduced. During the running in period proceed as follows:

- after starting let the compressor run on empty for 5-6 minutes.

After the first 50 hours carry out - in addition to the scheduled maintenance - the following tasks:

- change the compressor oil;
- change the oil filter;
- check and adjust nuts and bolts;

WARNING:



When changing the oil filter, inspect the internal part and check for any deposits; if they are present track down the cause before restarting the compressor.

2 - BASIC INFORMATION ON THE COMPRESSOR

2.1 - DESCRIPTION OF THE COMPRESSOR

High pressure compressor for breathing air and technical gases.

Compatible process gases:

- Carbon dioxide
- Nitrogen (also dry)
- Benzene
- Butadiene
- Helium
- Sulphur hexafluoride
- Natural gas
- Synthesis gas
- Hydrogen
- Methane
- Carbon monoxide
- Propane



2.2 - IDENTIFYING THE COMPRESSOR

Each compressor has an identification plate attached to its frame.

| | | |
|---|---------------------|---|
| AEROTECNICA COLTRI S.r.l. Via Colli Storici 177 25010 DESENZANO D/G (BS) ITALY Tel. 030/9910301-9910297 Fax. 030/9910283 | |  |
| MODEL | MCH 36/ETS SILENT | |
| TYPE | SC000296 | |
| S/N. | 0010 | |
| YEAR | 2005 | |
| MOTOR | ELECTRIC THREEPHASE | |
| POWER | 15KW 20HP | |

2.3 - GENERAL INSTRUCTIONS

WARNING:



- This manual must be read carefully before transporting, installing, using or carrying out any maintenance on the compressor.
- It must be preserved carefully in a place known to compressor users, managers and all transport/installation/maintenance/repair/final dismantling personnel.
- This manual indicates the purposes for which the compressor can be used and gives instructions for its transport, installation, assembly, adjustment and use. It also provides information on maintenance tasks, ordering spare parts, residual risks and staff training.
- It should be born in mind that the use and maintenance manual can never replace proper experience; some maintenance jobs are particularly difficult and in this regard the manual only offers general guidelines on the most important tasks, which must be carried out by personnel with proper training (e.g. acquired during training courses run by the manufacturer).
- This manual is an integral part of the compressor and must be stored in a suitable container near the compressor until its final demolition. If the manual is lost or damaged a copy can be requested from the manufacturer.
- Make sure all users have understood the regulations for use and the meaning of the symbols on the compressor.
- Observance of these technical instructions can prevent accidents: instructions have been drawn up in compliance with EEC Machinery Directive 89/392 and subsequent amendments.
- In any case always observe national safety regulations.
- Do not remove or damage guards, labels or notices, especially those required by law.
- The adhesives attached to the compressor are there for safety purposes. They must be replaced if they become illegible.
- This manual reflects the technical knowledge available at the time the compressor was sold and cannot be considered inadequate simply because updated at a later time on the basis of new experience.
- The manufacturer reserves the right to update products and manuals, without any obligation to update preceding products or manuals except in exceptional circumstances.
- To request or receive any updates or additions to this use and maintenance manual (which shall be considered an integral part of the manual) apply via the contact numbers given on page 12.
- Should you have any other queries or suggestions as to how to improve the manual please contact the manufacturer.
- Should you sell the compressor AEROTECNICA COLTRI Srl invites you to provide us with the details of the new owner so that any new additions to the manual can be sent on.

3 - SAFETY REGULATIONS

3.1 - GENERAL SAFETY RULES

3.1.1 - KNOW THE MACHINE

The compressor must only be used by qualified personnel. They must have an understanding of the arrangement and function of all the controls, instruments, indicators, warning lights and the various info plates/labels.

3.1.2 - WEAR PROTECTIVE CLOTHING

All operators must use accident prevention items such as gloves, hard hat, eye goggles, accident prevention shoes and ear defenders against noise.



3.1.3 - KEEP EMERGENCY EQUIPMENT NEARBY

Make sure a first aid cabinet and a CO₂ fire extinguisher are near the compressor. Keep the extinguisher fully loaded. Use according to standards in force.



3.1.4 - WARN OTHERS WHEN DOING CHECKS/MAINTENANCE

Apply a sign with the legend: "TESTING IN PROGRESS" on all sides of the compressor. Check the compressor carefully every day it is used as per the task list given in this manual.



3.2 - GENERAL PRECAUTIONS

- The EEC Machinery Directive 89/392 provides the following definitions (appendix 1, 1.1.1):
«DANGEROUS ZONE»: any zone inside and/or near a machine in which the presence of an exposed person constitutes a risk for his/her security and health.
«EXPOSED PERSON»: any person wholly or partially inside a dangerous zone.
«OPERATOR»: the person(s) charged with the task of installing, running, maintaining, cleaning, repairing and transporting the machine.

IMPORTANT:

- Before carrying out any task or operation with the compressor it is compulsory to read and follow the instructions given in the use and maintenance manual. Doing so during work is too late: improper use or an erroneous manoeuvre could cause serious damage or injury.
- The employer must provide workers with detailed information on the risk of accident, especially risks deriving from noise, use of safety devices and the general accident prevention regulations provided for by international laws or standards or national standards within the country of use. All operators must observe both international accident prevention standards and the national ones relevant to the country of use.
 Bear in mind that the European Union has issued directives concerning worker health and safety: these include EEC directives 89/391, 89/686, 89/654, 89/655, 89/656, 86/188, 92/58 and 77/576 which all employers are legally obliged to comply with.
- Before carrying out any work on the compressor each operator must have a perfect understanding of how the compressor works, know how to use the controls and have read the technical information contained in this manual.

WARNING:



It is forbidden to tamper with or replace compressor parts without obtaining prior authorisation from AEROTECNICA COLTRI Srl.
 The use of accessories, tools, materials subject to wear or spare parts other than those recommended by the manufacturer and/or illustrated in this manual can constitute a source of danger to operators and/or damage the machine.
 Any modification to the compressor that has not been expressly authorised by AEROTECNICA COLTRI Srl shall exonerate the manufacturer from any civil or penal liability.

IMPORTANT:

- Removing or tampering with any safety device is strictly forbidden.
- All installation, routine or unscheduled maintenance work must be carried out with the compressor at standstill and disconnected from the electrical power supply.
- Once the compressor has been cleaned the operator must check for any worn, damaged or loose parts; in this case seek assistance from the maintenance technician.
 It is especially important to check that flex hoses or other parts subject to wear are in good condition. Check also for any leaking of oil or other dangerous substances. If such situations arise it is forbidden to restart the compressor before the situation is resolved. If these problems are observed at the end of the refilling the operator must, before leaving the machine unattended, place a sign on the compressor indicating that maintenance work is in progress and that it must not be restarted.

IMPORTANT:

- Never place hands or introduce screwdrivers, keys or other tools into moving parts.
- Never clean with flammable fluids.
- Periodically check the info plates/labels and restore/replace them where necessary.
- The workplace must be kept clean, tidy and free from objects that might hinder movement.
- Operators must avoid carrying out “awkward” tasks in uncomfortable positions that might cause imbalance.
- Operators should be aware of the risk of entrapment caused by clothes or hair getting caught up in moving parts; wear a cap to contain long hair.
- Necklaces, bracelets and rings can also be a source of danger.
- Workplace lighting must be adequate for the work in progress. Insufficient or excessive lighting can generate risks.
- Always observe the instructions, accident prevention regulations and the warnings contained in this manual.

3.2.1 - IMPORTANT SAFETY INFORMATION

The compressor has been designed and built according to the state of the art and complies with technical regulations in force concerning compressors for the production of high pressure breathing air. The laws, regulations, standards and directives in force for such machines have been complied with.

Materials, parts, production procedures and quality controls all comply with the strictest safety and reliability standards.

Using the compressor for the purposes described in this manual, handling it with due diligence and carrying out maintenance and overhauls according to proper working practices will ensure long lasting performance and functionality.

3.2.2 - ACCIDENT PREVENTION

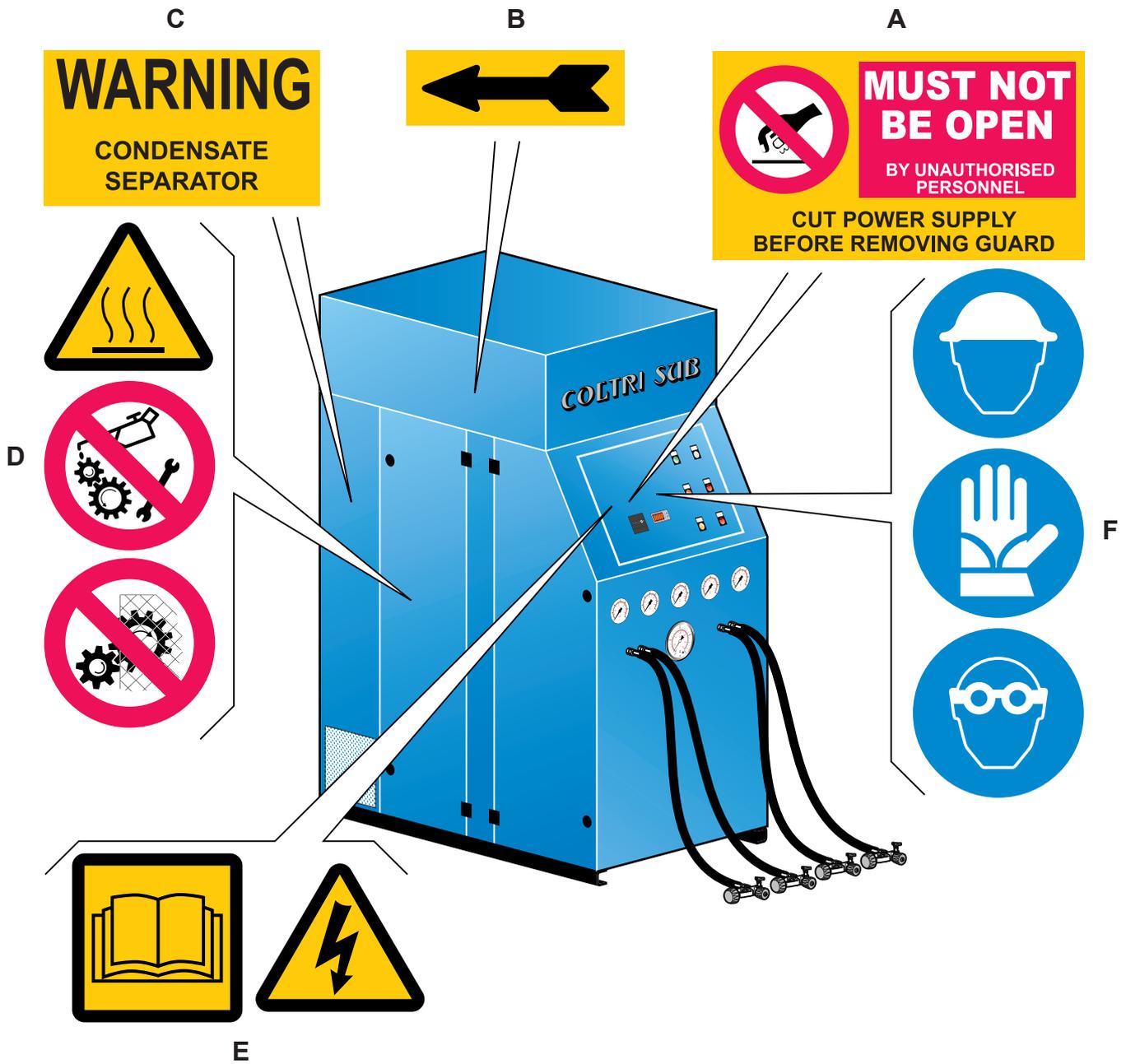
The manufacturer cannot be held liable for accidents that occur during use of the compressor as a result of the user's non-observance of the laws, regulations, standards and directives in force for high pressure compressors. The compressor has been designed for use in weather conditions as described on page 15.

3.2.3 - WORKING SAFETY

The constructor cannot be held liable for malfunction or damage if the compressor:

- is used for purposes other than that for which it is intended;
- is not handled or maintained according to the instructions specified in this manual;
- is not periodically and continually maintained as instructed or if non-original spare parts are used;
- machine parts are modified or replaced without written authorisation from the manufacturer, especially where the efficiency of safety devices has been reduced or eliminated;
- where it is used outside the admissible temperature range.

3.2.4 - SAFETY INFO LABELS: LOCATION



3.2.5 - SAFETY INFO LABELS: DESCRIPTION

A

Warning label.
 Unauthorised, unqualified personnel are forbidden from opening the control panel.
 The power supply must always be disconnected before carrying out any work on the control panel.



B

Cooling fan direction of rotation info label.
When using the machine for the first time check that the fan rotates in the direction indicated by the arrow. If the fan rotates against the direction of the arrow invert two of the three phases on the main power lead.



C

Condensate collection tank info label.
This points out that the condensate separator must be emptied regularly as per the instructions in this manual.



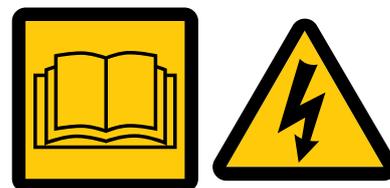
D

Hot parts warning label.
Label warning that lubrication and maintenance must never be carried out with the compressor running.
Label warning that safety devices and guards must not be removed.



E

Label warning against presence of live parts.
Warning plate; read the use and maintenance manual and the appendices carefully before running the compressor.



F

Label with ideogram indicating that hard hat must be worn.
Label with ideogram indicating that protective gloves must be worn.
Label with ideogram indicating that eye goggles must be worn.



3.2.6 - RESIDUAL RISK ZONES

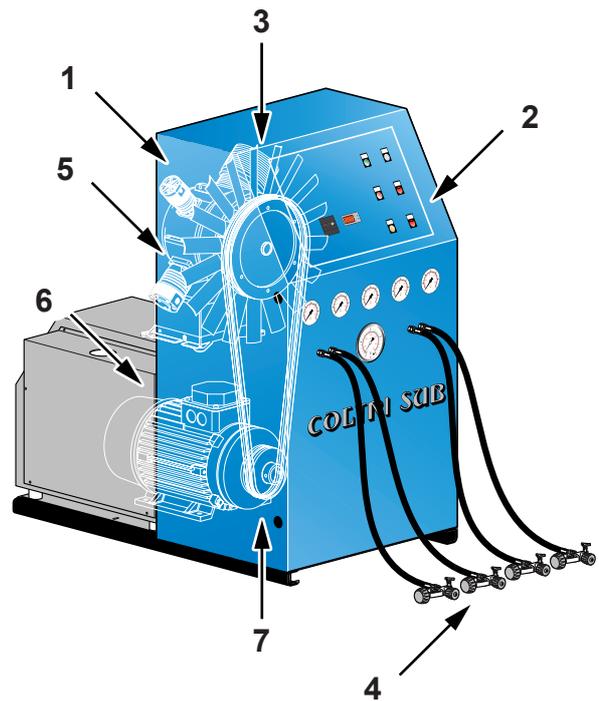
DANGER:



In some compressor zones there remain residual risks that were not possible to eliminate at the design stage or for which safety guards could not be provided without compromising the functionality of the MCH-36. To prevent accidents all operators must be aware of the residual risks on this compressor.

Residual risk zones:

- 1 Danger of polluting the produced air due to the possibility of mixing exhaust fumes or lubricating oil vapours with the compressed air being produced.
- 2 Electrical dangers. Use the machine with suitable insulation, especially against water and humidity.
- 3 Danger of impact/abrasion in the cooling fan zone.
- 4 Danger of direct contact with operator in the event of hose burst during bottle refill.
- 5 Danger deriving from noise emitted by the compressor.
- 6 Fire risk.
- 7 Risk of being crushed or dragged in the transmission belt zone.



3.3 - GENERAL SAFETY REGULATIONS

3.3.1 - CARE AND MAINTENANCE

Damage and accidents are often caused by maintenance errors, such as:

- no oil,
- insufficient cleaning,
- compressed air circuit inefficiency (flex hoses damaged, loose pipes, screws etc.).

Maintenance work must be carried out with due care and attention: your safety depends on it.

Never postpone repairs.

Repairs must only be carried out by specialised or authorised personnel.

Always observe the following safety regulations, even when you become completely familiar with working procedures:

- Keep the compressor and the surrounding area clean at all times.
- Before starting work check that safety devices/guards are in good working order.
- Make sure no-one is in the compressor danger zone. Interrupt work if anyone is in the danger zone and tell them to leave.
- Never leave the machine unattended when it is on.

3.3.2 - FIRE EXTINGUISHERS AND FIRST AID

- Check that a fire extinguisher is present. Make sure you know where it is.
- Periodically check that extinguishers are full and operators know how to use them.
- The location of the first aid cabinet must be known.
- Check the first aid cabinet periodically to make sure it contains disinfectant, bandages, medicines etc.
- Fire drills must be known.
- Make sure a phone number for emergency medical assistance is kept nearby.

IMPORTANT:

The provision of a fire extinguisher is the responsibility of the owner of the compressor.

3.4 - MAINTENANCE PRECAUTIONS

3.4.1 - WARNING SIGNS

Before doing any maintenance work, stop the engine and make sure the compressed air system is depressurised.

If other people start the engine or act on the control pushbuttons/keys while maintenance work is in progress there is a risk of serious injury or death.

To obviate these dangers always place warning signs around the compressor before carrying out maintenance.



3.4.2 - TOOLS

Use only manufacturer-recommended tools; do not use worn, damaged, poor quality or improvised tools as they can cause injury.

WARNING:



The manufacturer cannot be held liable for any damage or injury caused by the use of tools that are not prescribed or modified without authorisation.

3.4.3 - PERSONNEL

The routine maintenance tasks described in this manual must only be carried out by trained, authorised personnel.

For component maintenance/revision tasks not covered by this manual please contact **AEROTECNICA COLTRI S.r.l.**

3.4.4 - KEEP THE COMPRESSOR CLEAN

Oil and grease stains, scattered tools or broken pieces constitute a danger to personnel as they may cause slips and falls. Always keep the compressor and the surrounding work area clean and tidy.

Clean the compressor with a pressurised hot water or steam jet and commercially available detergents. Do not use diesel, petrol or solvents as the former leave an oily film that causes dust to stick while solvents (even where weak) damage the paintwork and can lead to rust.

If the water jet gets inside the electrical parts it could, in addition to oxidising the contacts, prevent the machine being started or even cause **a sudden, unexpected start**.

For this reason **never** use water or steam jets on sensors or connectors.

3.4.5 - SPERIODIC REPLACEMENT OF ESSENTIAL SAFETY PARTS

Periodically check the following components, which are important for fire prevention:

- compressed air system: main compressed air circuit delivery hoses;
- bottle refill system: flex hoses for bottle refill.

Even though they may appear to be in good condition, these components must be periodically replaced with new ones. Over time these components tend to deteriorate.

Should any of these parts prove to be faulty, replace or repair them ahead of schedule.

4 - TECHNICAL DATA

4.1 - TECHNICAL CHARACTERISTICS

4.1.1 - MONOBLOC, GOOSENECK, PISTONS, CYLINDERS

The monobloc is made of aluminium alloy; the flange with the roller bearings that support the gooseneck is kept oil-tight with the monobloc by O-rings.

The gooseneck and the connecting rods run on roller bearings only. The four connecting rods are fitted on the gooseneck with a single crank angle.

The cylinders are made of cast iron and feature traditional multiple piston rings.

4.1.2 - VALVES

The 1st, 2nd and 3rd stage valves are inserted in the head seats and held in place by a bracketing system.

The 4th stage valves are disassembled by removing the head.

4.1.3 - SAFETY VALVES

The safety valve is pre-adjusted during assembly of the compressor and prevents it being damaged in the event of a malfunction. The infeed pressure, as a function of the valve, is as follows:

225 Bar - (3200 PSI)

330 Bar - (4700 PSI)

WARNING:



Tampering with the safety valve can cause serious damage and renders the warranty null and void.

4.1.4 - COOLING PIPES, LUBRICATION

The cooling pipes are made of stainless steel.

Lubrication with low pressure oil pump, delivery distributor and paper oil filter with clogging safety valve.

4.1.5 - FRAME, GUARDS

The compressor is mounted on a welded steel frame that has been painted with epoxy resins. The cooling fan and the trapezoidal transmission belt are protected by steel guards.

4.1.6 - TECHNICAL SPECIFICATIONS TABLE

| | |
|-----------------------------------|---|
| Construction | high pressure compressor with forced air cooling and 4 compression stages |
| Max. peak non-continuous pressure | 225bar - 3300PSI 330bar - 4700PSI |
| Flow rate | approx. 600 l/min. 21 cfm |
| Cylinder diameter | 130 - 60 - 32 - 14 mm |
| Piston stroke | 50 mm |
| RPM | 1300 rpm |
| Intermediate pressures | 1 st stage 3.5 bar – 50 PSI 2 nd stage 18 bar – 260 PSI 3 rd stage 70 bar – 1000 PSI 4 th stage 225 bar – 3300 PSI 5 th stage 330 bar – 4700 PSI |
| Oil pressure | 4 bar cold 1.5 bar during routine use 1 bar minimum pressure |
| Motor power | 15kW |
| Voltage and frequency | 400V - 50Hz 440V - 60Hz 230V - 50Hz 230V - 60Hz |

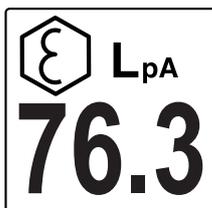
4.1.7 - NOISE LEVEL

The MCH-36 compressors have been designed and built to reduce noise pollution to a minimum. Compressor noise levels were measured in the “operator” (work) area.

MCH-36 SILENT:



MCH-36 OPEN V.M.:

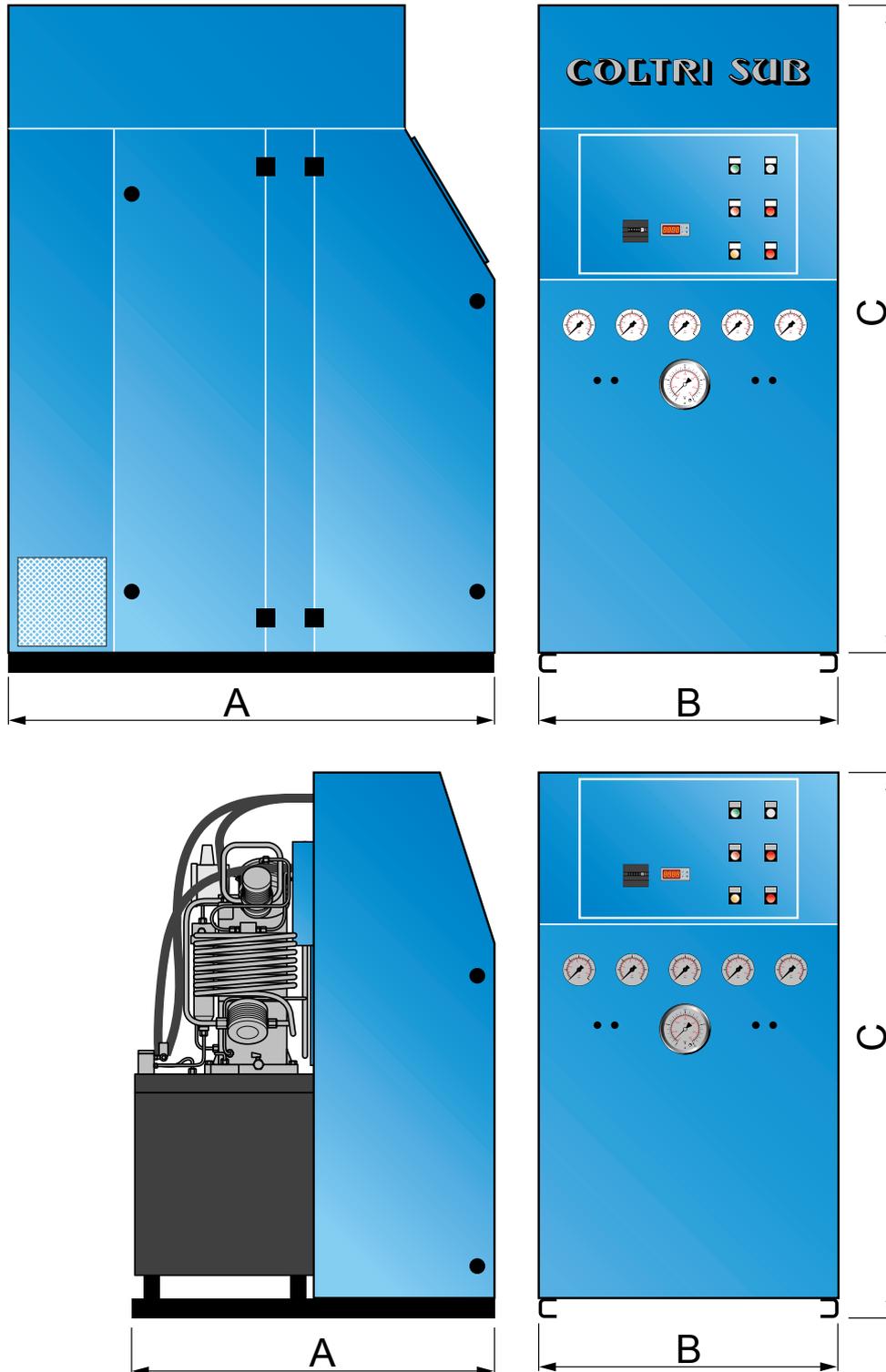


WARNING:



Should the compressor be used where the daily noise exposure level is greater than 80 dBA, the employer must apply all the relevant worker health and safety measures. Where necessary operators must use personal protection such as ear defenders.

4.1.8 - DIMENSIONS AND WEIGHTS

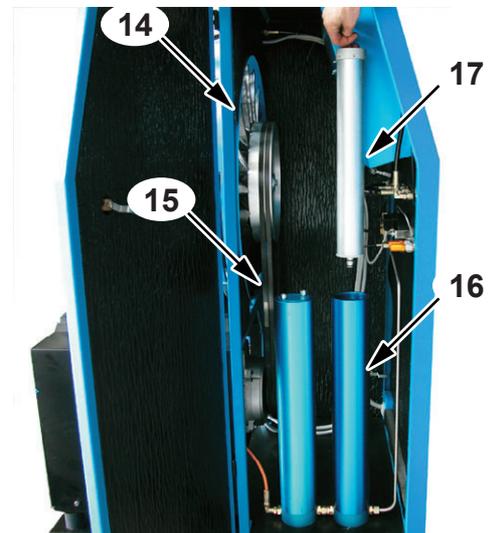
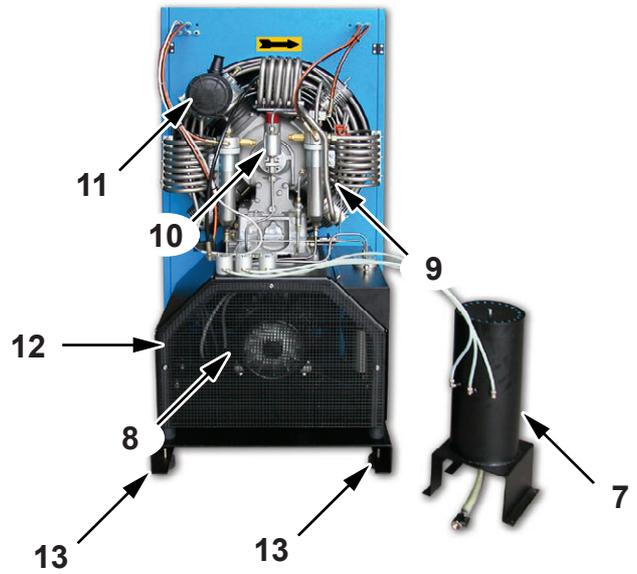


| | A (mm) | B (mm) | C (mm) | Weight (Kg) |
|----------------|--------|--------|--------|-------------|
| MCH-36 | | | | |
| SILENT | 1300 | 800 | 1800 | 457 |
| OPEN VM | 1000 | 800 | 1540 | 365 |

4.1.9 - MACHINE PARTS

Description:

- 1 Frame
- 2 Control panel
- 3 Gauges
- 4 Hoses
- 5 Refill taps
- 6 Condensate collection can
- 7 Condensate collection recipient
- 8 Electric motor
- 9 Compressor
- 10 Oil filter
- 11 Air filter
- 12 Safety mesh
- 13 Anti-vibration devices
- 14 Cooling fan
- 15 Belt
- 16 Active carbon air filter
- 17 Active carbon air filter cartridge



5 - HANDLING AND INSTALLATION

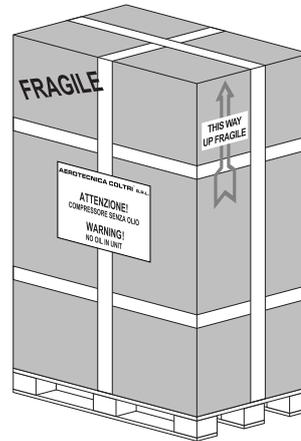
5.1 - UNPACKING

The **MCH-36** compressor is sent fully assembled, but with the supplied flex hoses separate.

The compressor is packed in a cardboard box; the latter is placed on a europallet to simplify handling and transport.

The box containing the compressor must be moved according to the instructions shown on the box itself. The machine is supplied with the following as standard:

- 4 refill hoses, each 1200 mm long with tap;
- use and maintenance manual
- appendix to the use and maintenance manual (Safety standards)
- Canned lubricating oil (5 litres)



5.2 - HANDLING

After separating the compressor from its packaging it can be transported to the designated placement area. Transfer will require the use of a fork-lift truck or transpallet (of suitable load-bearing capacity): the forks must be inserted in the feet of the europallet on which the compressor is positioned. The compressor has runners for handling with fork-lift trucks or transpallets.

5.3 - INSTALLATION

WARNING:



Before proceeding with the installation tasks described below, read Chapter 3 "SAFETY REGULATIONS" carefully.

IMPORTANT:

Compressors used on board boats can be certified via a R.I.Na (Registro Navale Italiano) test; this test should be explicitly requested at the time of order.

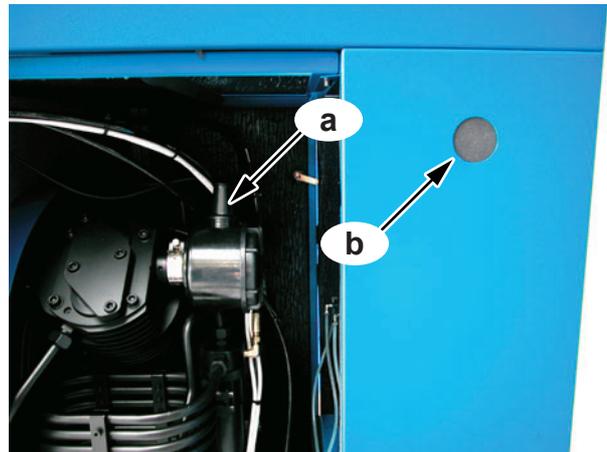
5.3.1 - POSITIONING

- Position the compressor in the designated area and check it is level. For compressor dimensions please consult section 4.1.8 "Dimensions and weights".
- Check that the area in which the compressor is to be positioned is adequately ventilated: good air exchange (more than one window), no dust and no risk of explosion, corrosion or fire.
- If ambient temperatures exceed 45°C air conditioning will be necessary.
- Position the compressor no closer than 1 m to surrounding walls; the gap between compressor and ceiling should be at least 1.5 m. These distances ensure proper compressor operation and proper cooling of the pumping unit.
- Make sure that lighting in the area is sufficient to identify every detail (such as the writing on the info labels); use artificial lighting where daylight is on its own insufficient.

5.3.2 - AIR INTAKE EXTENSION CONNECTION

If the compressor is installed in an area without the necessary ventilation requisites described in section 5.3.1 "Positioning", it will be necessary to install an air intake extension leading in from outdoors or a place with the cited ventilation requisites.

- The extension, supplied as an optional, must be connected to the intake connector (a).
- Connect the extension pipe to the fitting.
- Pass the pipe through the hole on the side panel (b) (Silent version).
- Fit the supplementary air intake filter on the end of the extension pipe.
- Position the end of the extension with the air intake filter in a properly ventilated area sheltered from weather and exhaust fumes.
- Point the air intake against the wind.
- Check that there are no kinks or breaks along the pipe. If it is damaged replace it.



WARNING:



Use only a flexible pipe with internal steel braiding reinforcement so as to prevent kinks and a consequent reduction of cross-section.

WARNING:



Do not aspirate harmful gases or exhaust fumes.

5.3.3 - REFILL HOSE CONNECTION

Attach the bottle refill hoses as follows:

- Screw the hoses onto the fittings (a)
- Use a dynamometric wrench to tighten the hoses to the compressor with a torque of 15 Nm.



IMPORTANT:

The hoses must be replaced periodically (yearly or every 1000 hours) or when there are signs of wear/abrasion.
The minimum bending radius of the hoses is 250 mm.

5.3.4 - ELECTRICAL CONNECTION

The compressor is delivered together with power lead and plug (4-pole, 32 A).

To connect up to the power supply just insert the plug in the mains power socket.

Check that the data on the compressor ID plate is compatible with mains power supply, especially as regards rated current and voltage.

The mains power system must have an efficient ground (earth); check that the earth resistance value complies with the protection / operational requirements of the compressor electrical system.

WARNING:



Before inserting the plug, check that the electrical system complies with the standards in force in the country of installation.

An efficient compressor ground (earth) system is an essential compressor safety requisite.

6 - USING THE COMPRESSOR

6.1 - PRELIMINARY CHECKS BEFORE USING FOR THE FIRST TIME

The operator must check that the compressor is supplied with:

- use and maintenance manual;
- appendix to the use and maintenance manual;

If the compressor is sold on the customer/user must provide the purchaser with a complete, undamaged use and maintenance manual.

6.1.1 - FILLING WITH LUBRICATING OIL

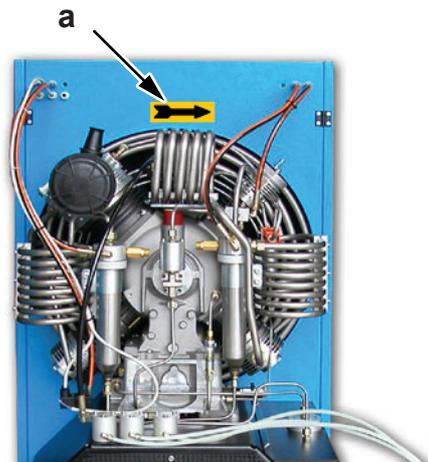
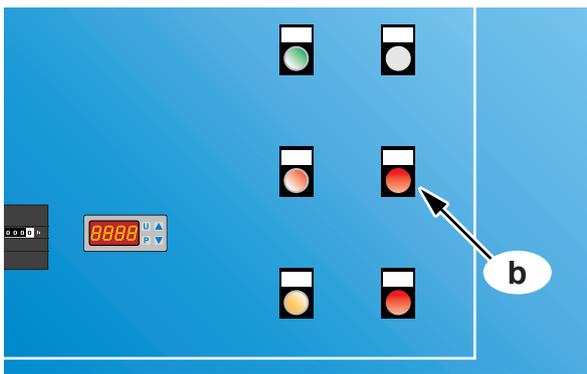
At the time of delivery the compressor does not contain lubricating oil; this is supplied together with the compressor in cans contained in the packaging.

For filling instructions sees section “7.6.3 Changing the lubricating oil and filter”.

6.1.2 - CHECKING FOR PROPER ELECTRICAL CONNECTION

Check for proper connection of electrical phases by checking that the cooling fan rotates in the direction indicated on the label (a) on the fan cover.

If the direction of rotation is not as indicated by the arrow the warning light (b) on the control panel comes on; it will then be necessary to disconnect the electrical power supply and invert two of the three phases on the main power lead.



DANGER:



Before carrying out this task disconnect the compressor from the mains power supply.

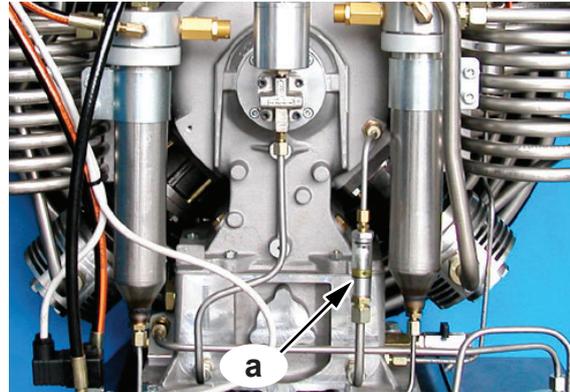
Do not invert or disconnect the ground (earth) wire (yellow/green).

6.2 - CHECKS TO BE RUN AT THE START OF EACH WORKING DAY

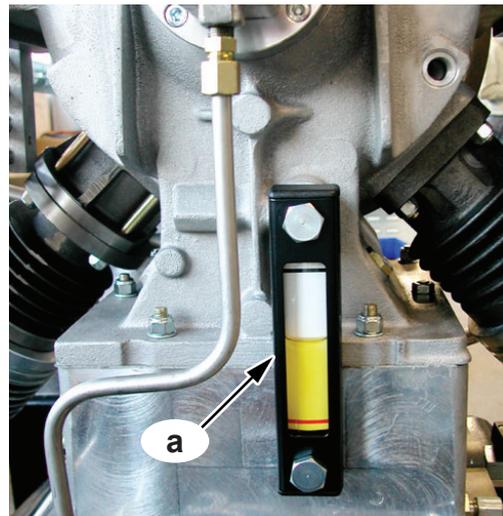
Inspect the exterior of the compressor (couplings, pipes, pneumatic components etc.) and check for any oil leaks.

6.2.1 - LUBRICATING OIL LEVEL CHECK

Check that the level of lubricating oil (a) is within acceptable limits (i.e. between min. and max.). Note that an excessive quantity of oil can cause infiltrations in the cylinders and leave deposits on the valves while too low a level prevents proper lubrication and could cause engine seizure. If the oil level is not within the minimum and maximum limits top up or drain as described in section "7.6.3 Changing the lubricating oil and filter".



Version produced up to 31-12-2005



Version 2006

6.2.2 - CHECKING THAT THE REFILL HOSES ARE IN GOOD CONDITION

Inspect the refill hoses and make sure there are no cuts, holes, abrasions, leaks etc. If necessary replace with new hoses.

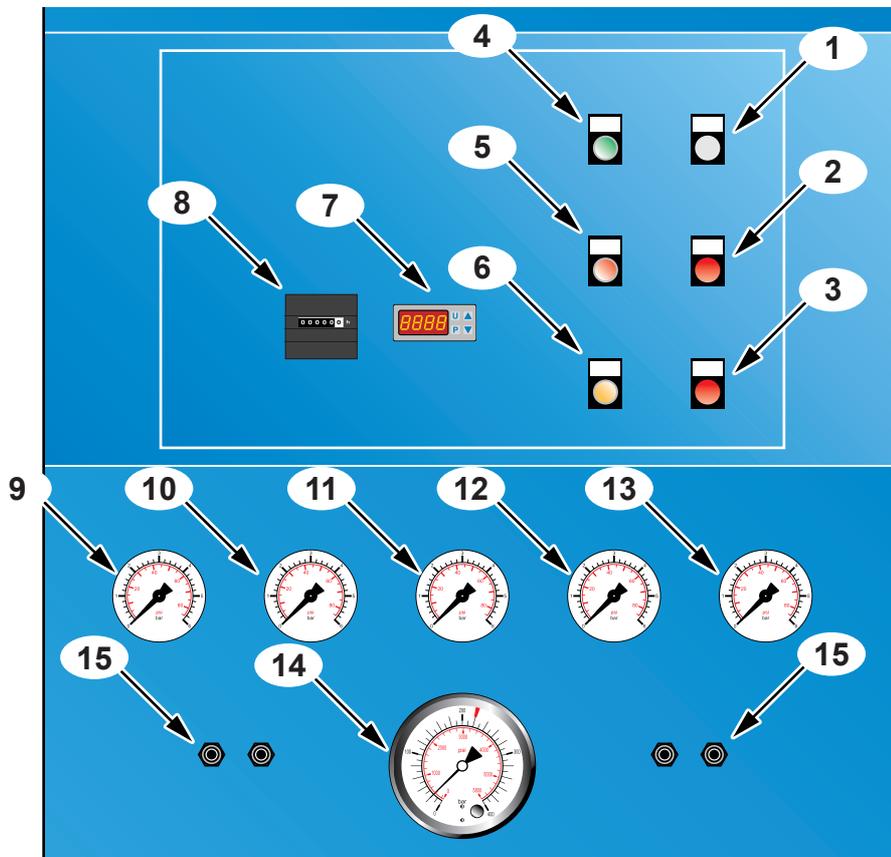
6.2.3 - STORING TECHNICAL DOCUMENTATION

The use and maintenance manual and its appendices must be stored carefully and must always be kept where they can be accessed easily for immediate consultation.

WARNING:

The use and maintenance manual is an integral part of the compressor and must always be handed over in the event of a change of ownership.

6.3 - CONTROL PANEL

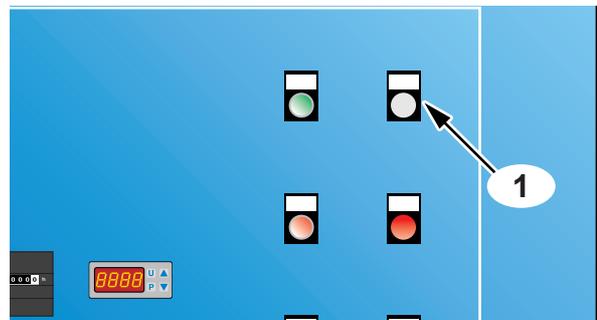


KEY:

- | | |
|--|---------------------------------------|
| 1 Power indicator light | 9 Oil pressure gauge |
| 2 Direction of rotation indicator light | 10 1st stage pressure gauge |
| 3 Oil level warning light | 11 2nd stage pressure gauge |
| 4 ON pushbutton | 12 3rd stage pressure gauge |
| 5 Stop-emergency pushbutton | 13 Working pressure gauge |
| 6 Manual condensate discharge pushbutton | 14 Automatic shutdown pressure switch |
| 7 Cabinet interior / cooling air temperature | 15 Refill hoses connection |
| 8 Hour counter | |

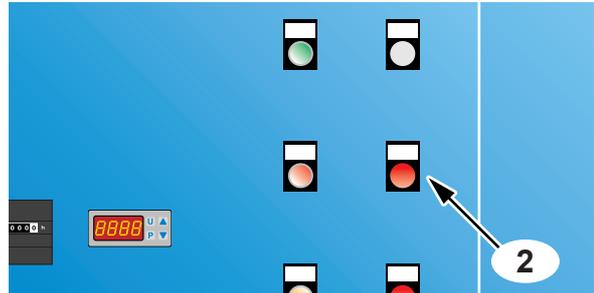
6.3.1 - POWER INDICATOR LIGHT

When the power indicator light (1) is on the compressor is powered.



6.3.2 - DIRECTION OF ROTATION INDICATOR LIGHT

If the direction of rotation indicator light (2) comes on this means that the main power phases are inverted. To restore proper operation disconnect from the electrical power supply and invert two of the three phases on the main power lead plug.



DANGER:

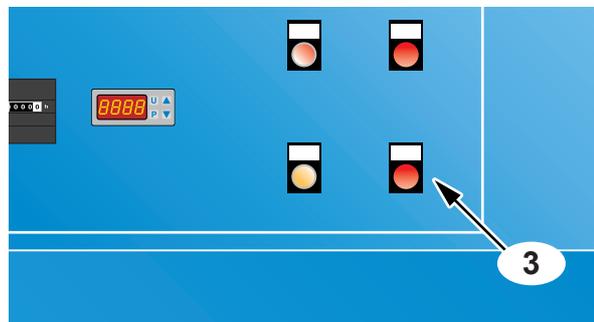


Before carrying out this task disconnect the compressor from the mains power supply.

Do not invert or disconnect the ground (earth) wire (yellow/green).

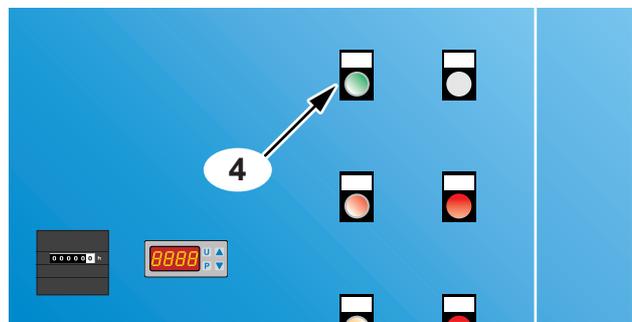
6.3.3 - LUBRICATING OIL LEVEL WARNING LIGHT

When the lubricating oil level warning light (3) is on the oil level in the cup is too low. Restore the oil level as described in section "7.6.3 Changing the lubricating oil and filter".



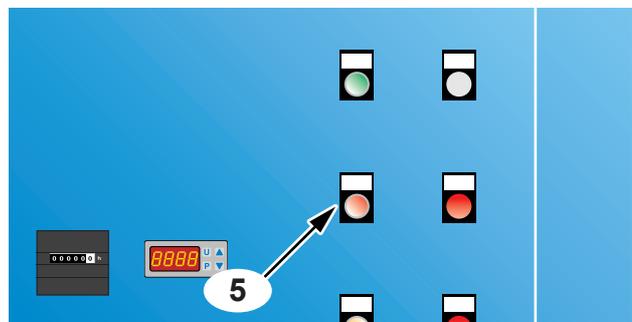
6.3.4 - ON PUSHBUTTON

Press the green ON pushbutton (4) to start the compressor. The compressor will run until the pressure setting on the adjustable pressure switch (14) has been reached or the safety valve is activated.



6.3.5 - STOP-EMERGENCY PUSHBUTTON

Press the stop-emergency pushbutton (5) to shut down the compressor. Check that the emergency pushbutton is working properly at the start of each working day: do this by switching on the compressor and pressing the pushbutton; if the compressor does not stop immediately after pressing disconnect the compressor from the mains power supply and contact AEROTECNICA COLTRI S.r.l.



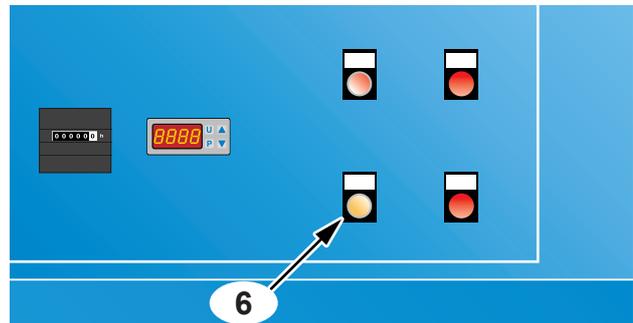
WARNING:



IT IS ABSOLUTELY FORBIDDEN TO TAMPER WITH THE EMERGENCY PUSHBUTTON.

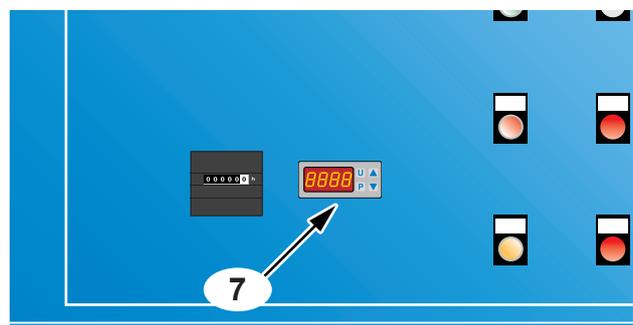
6.3.6 - MANUAL CONDENSATE DISCHARGE PUSHBUTTON

Pressing the manual condensate discharge button (6) drains the condensate accumulated in the collector during use of the compressor.
To discharge the condensate see section “7.10 Condensate discharge”.



6.3.7 - CABINET INTERIOR / COOLING AIR TEMPERATURE

The cabinet interior temperature display (7) indicates the temperature in °C inside the compressor cabinet.
The temperature is set by the compressor manufacturer.
The temperature may only be reset after obtaining authorisation from AEROTECNICA COLTRI S.r.l.
This task must only be carried out by qualified personnel.



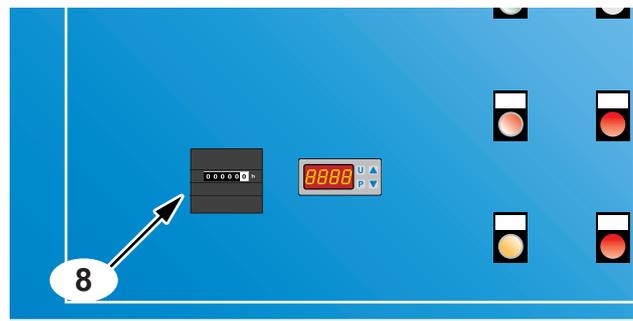
WARNING:



Temperature parameters must not be changed without prior authorisation from AEROTECNICA COLTRI S.r.l.: doing so will render the warranty null and void (where still valid).

6.3.8 - HOUR COUNTER

The hour counter (8) indicates the hours of effective compressor operation: use this information to observe maintenance schedules.

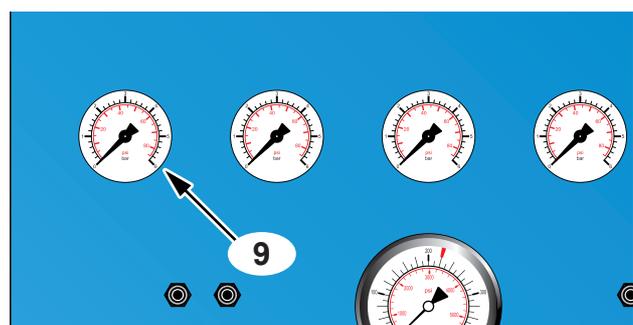


6.3.9 - LUBRICATING OIL CIRCUIT PRESSURE GAUGE

The gauge (9) indicates the pressure inside the lubricating oil circuit.
If pressure is less than 1 bar check: oil level, oil filter, oil viscosity.
If pressure is higher than 4 bar there is an obstruction along the circuit; change the oil filter and restart the machine. If pressure is still high contact AEROTECNICA COLTRI S.r.l.

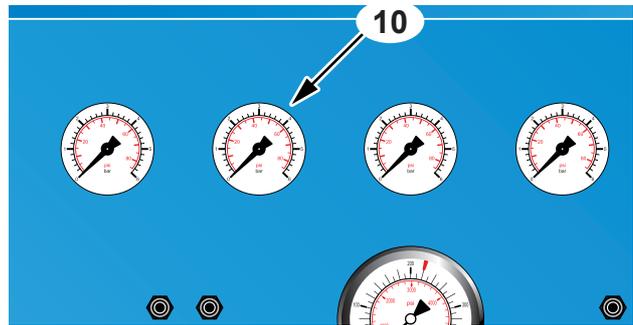
Compressor oil pressures are as follows:

- 4 bar cold
- 1.5 bar working pressure
- 1 bar minimum pressure



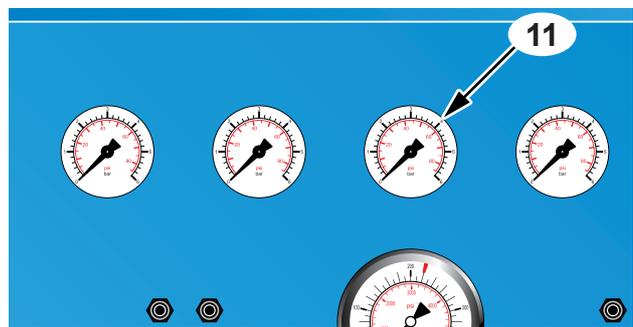
6.3.10 - 1st STAGE PRESSURE GAUGE

The gauge (10) indicates the pressure inside the 1st compression stage.
 If pressure is not between 3 bar (45 PSI) and 4 bar (60 PSI) switch off the compressor and contact AEROTECNICA COLTRI S.r.l.



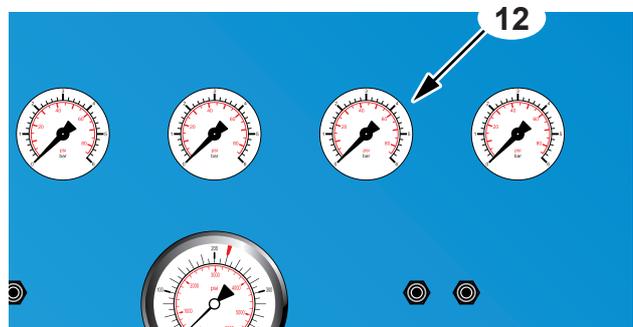
6.3.11 - 2nd STAGE PRESSURE GAUGE

The gauge (11) indicates the pressure inside the 2nd compression stage.
 If pressure is not between 16 bar (230 PSI) and 20 bar (290 PSI) switch off the compressor and contact AEROTECNICA COLTRI S.r.l.



6.3.12 - 3rd STAGE PRESSURE GAUGE

The gauge (12) indicates the pressure inside the 3rd compression stage.
 If pressure is not between 65 bar (940 PSI) and 80 bar (1200 PSI) switch off the compressor and contact AEROTECNICA COLTRI S.r.l.

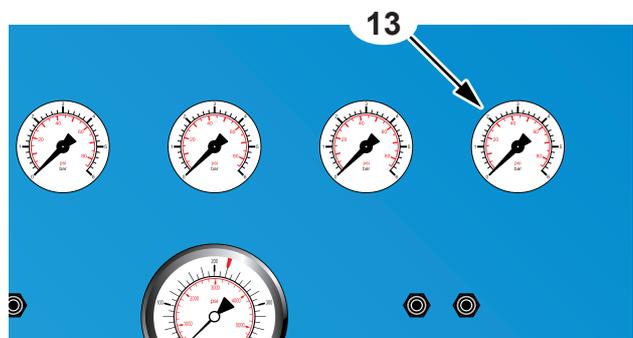


6.3.13 - WORKING PRESSURE GAUGE

The gauge (13) indicates air pressure as it exits the compressor.
 If the compressor fails to reach the pressure set on the pressure switch, switch off the compressor and contact AEROTECNICA COLTRI S.r.l.

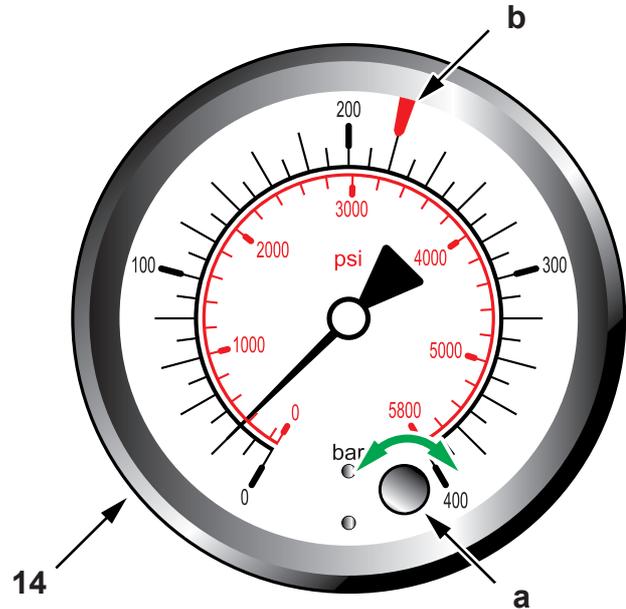
Working pressure:

- 225 bar - 3200 PSI
- 330 bar - 4700 PSI



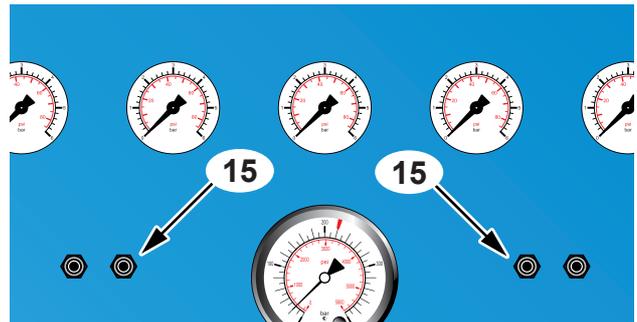
6.3.14 - ADJUSTABLE AUTOMATIC SHUTDOWN PRESSURE SWITCH

The automatic shutdown pressure switch (14) determines the compressor shutdown pressure. The shutdown pressure can be set via the regulator (a) and displayed via the indicator (b). When the compressor reaches the set pressure it shuts down automatically. The compressor can reach a maximum pressure of 330 bar.



6.3.15 - EFILL HOSE CONNECTION

There are four hose connection fittings (15). Hose taps not in use must be closed.



DANGER:



Bottle refill pressure is very high: before starting refilling check that the bottles are connected properly and in good condition. Check that all hose taps not in use are closed properly so as to prevent dangers caused by hose movement.

During the bottle refill procedure any persons not directly involved in the process must maintain a safety distance of at least three metres.

Disconnection of hoses from fittings or refill tap while the machine is under pressure is forbidden.

6.4 - PRELIMINARY TASKS

6.4.1 - SAFETY VALVE CHECKS

Check that safety valves are working properly by starting the compressor with the end taps closed: this will raise circuit pressure fast and trip the valves when their pressure setting is reached. The valves are pre-adjusted to 225 bar (3200 PSI) or 330 bar (4700 PSI).

Check that the bottles to be refilled are in good condition: they must have been tested by the relevant authorities (stamped and/or certified). Run a visual check on the exterior.

Check that hoses and relevant fittings are in good condition.

After being refilled do not empty the bottles completely, not even during winter storage or long periods of inactivity: this will stop humidity getting in.

IMPORTANT:

Tampering with the safety valve to increase the pressure setting is strictly forbidden. Tampering with the safety valve can seriously damage the compressor, cause serious injury to personnel and renders the warranty null and void.

DANGER:



Should bottles show evident signs of internal/external corrosion, do not refill them even if they have been tested.

WARNING:



Use only tested bottles (as proven by a test stamp and/or certificate). The working and bottle refill pressures are shown on the bottles themselves. It is forbidden to refill them at a pressure greater than that indicated.

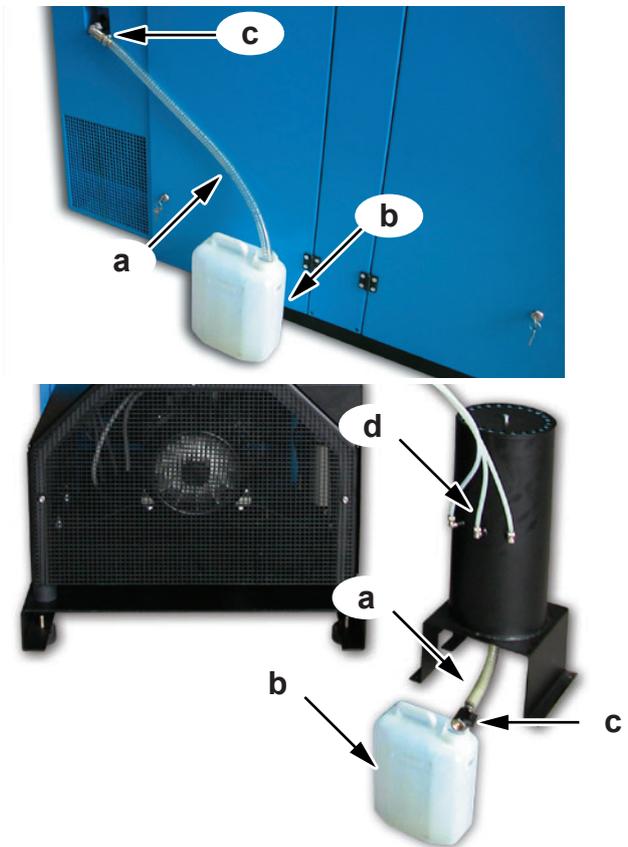
6.4.2 - AUTOMATIC CONDENSATE DISCHARGE

The condensate gathered in the container (d) must be drained as described below every 5 working hours of the compressor.

Insert the condensate drain pipe (a) in a collection can (b) and open the drain tap (c).

The release of vaporised water with lubricating oil during bottle refill is normal: the quantity depends on the level of humidity in the air.

The condensate must be disposed of as per the instructions shown in paragraph "9.1 Waste disposal".



6.5 - BOTTLE REFILL

IMPORTANT:

During refill the operator must be in the work area (see "4.1.7 Noise level"). It is advisable, during the bottle refill phase, to submerge the bottles in cold water so as to reduce the drop in pressure that accompanies cooling of the bottle.

WARNING:



During bottle refill those not involved in the refill procedure must maintain a safety distance of at least 3 metres. Also, it is forbidden to disconnect the hoses from the fittings or the refill tap while the machine is under pressure.

The available bottle refill connectors are:



INT

DIN230

DIN300USA

DIN300

ITALIAN CONNECTOR FOR SELF-PROTECTING SCBA

To refill the bottles proceed as follows:

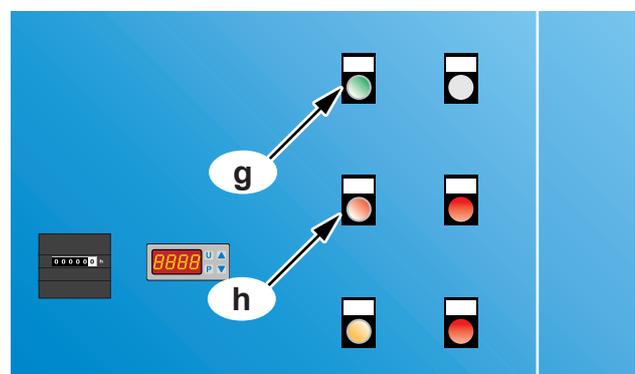
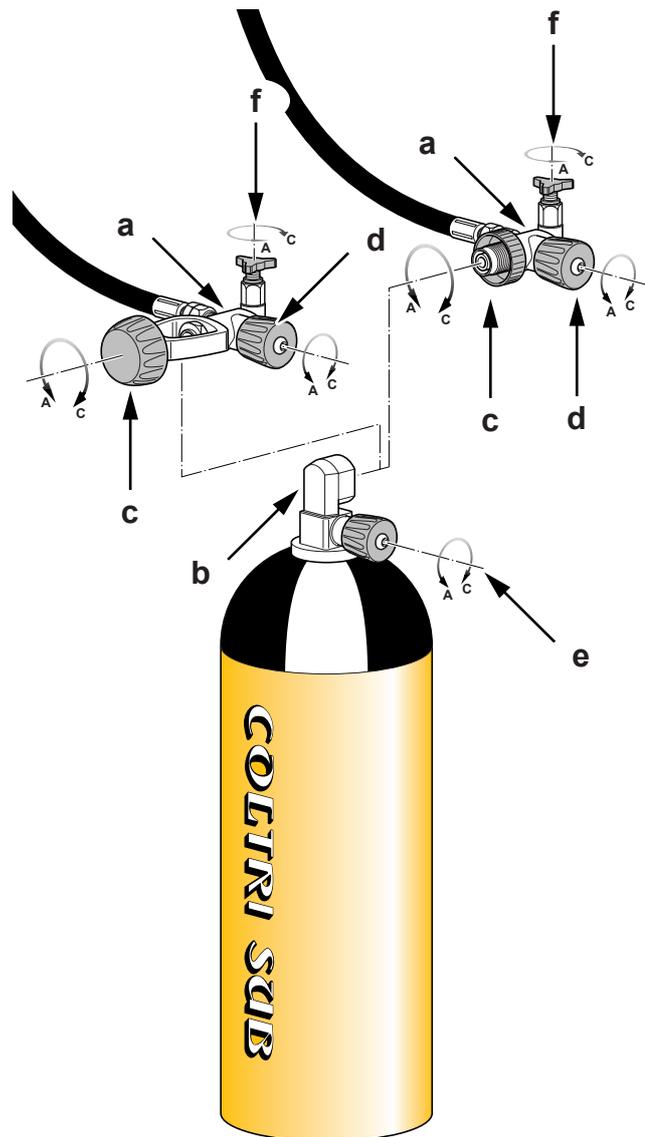
- Fit the hose connector (a) to the bottle tap (b)
- Screw in the fixing knob (c) until it is completely tightened
- Check that the bleed tap (f) is closed by rotating it clockwise
- Open the tap (d) by rotating it anticlockwise
- Open the tap (e) by rotating it anticlockwise
- Start the compressor by pressing the pushbutton (g)
- When the refill has been completed the compressor shuts down automatically
- Close taps (d) and (e) by rotating them clockwise
- Open the bleed tap (f) by rotating it anticlockwise until all the residual air in the fitting has been expelled
- Unscrew the fixing knob (c) by rotating it anticlockwise
- Disconnect the bottle coupling.

If an emergency situation arises during refill, press the stop pushbutton (h).

The compressor is nevertheless equipped with a safety system that shuts it down automatically when:

- The pressure setting on the pressure switch has been reached.
- The electrical power supply is temporarily cut.
- The electric motor overload device is tripped.

Following an emergency shutdown always make sure the cause of the emergency has been eliminated before proceeding with another refill.



7 - MAINTENANCE

WARNING:



Maintenance tasks must only be carried out by the AEROTECNICA COLTRI S.r.l. Customer Assistance Service or qualified personnel.

DANGER:



All maintenance tasks must be carried out with the compressor off and the power lead unplugged from the mains socket.

7.1 - FOREWORD

To obtain the best possible performance from the compressor and ensure a long working life for all its parts it is essential that personnel follow the use and maintenance instructions with extreme diligence. It is thus advisable to read the information below and consult the manual every time an inconvenience arises. For further information please contact our assistance centre:

Contact the AEROTECNICA COLTRI S.r.l. Maintenance Service Centre

Tel. +39 030 99 10 297

Fax. +39 030 99 10 283

e-mail: coltrisub@coltrisub.it

7.2 - GENERAL

- Proper preservation of the compressor requires thorough cleaning.
- This type of refill station, designed and built according to the most advanced technological criteria, requires only minimum preventive and routine maintenance.
- Before carrying out any maintenance tasks, run checks and/or controls on the compressor, switch off the compressor, remove the plug from the mains socket.
- The residual pressure present in the compressor (pumping circuit) must be released.
- During disassembly and re-assembly of the compressor, always use suitable wrenches/tools so as not to damage the relevant components.
- Loosen stiff parts with a copper or plastic mallet.
- When refitting parts make sure they are clean and lubricated sufficiently.
- Compressor maintenance tasks must only be carried out by authorised personnel and recorded in the "Maintenance register" section of this manual.

7.3 - UNSCHEDULED MAINTENANCE

Involves repair and/or replacement of the mechanical parts of one or more compressor components: this work normally needs doing only after some years of use. If substantial modifications are made, the manufacturer cannot be held liable for any dangers that might arise.

This work must be carried out by the assistance centre.

7.4 - SCHEDULED MAINTENANCE TABLE

| Maintenance | Every 5 hours | Every day | Every year | 250 (hours) | 500 (hours) | 1000 (hours) | 3000 (hours) |
|---|---------------|-----------|------------|-------------|-------------|--------------|--------------|
| Lubricating oil level check | | ○ | | | | | |
| Automatic shutdown check | | ○ | | | | | |
| Condensate container discharge | ○ | ○ | | | | | |
| Belt wear and tension | | | ○ | | ● | | |
| Air intake filter | | | ● | ● | | | |
| Fitting/hose leak check | | | ○ | | ○ | | |
| Oil filter and oil change | | | ● | ● | | | |
| Separator filter element cleaning | | | ○ | | | ○ | |
| 1st – 2nd – 3rd stage valve replacement | | | | | | ● | |
| 4th stage valve replacement | | | | | ● | | |
| Water and HP oil separator replacement | | | | | | | ● |
| HP filter body replacement | | | | | | | ● |

○ Checking and cleaning ● Change

7.5 - TROUBLESHOOTING

| Problem | Cause | Solution |
|---|--|---|
| - The electric motor does not start | • Phase missing | • Check fuses or condenser |
| - Rotation speed and flow rate decrease | • Motor power too low • The belt slips | • Check the motor and the line • Restore proper belt tension |
| - The flow rate diminishes without rpm decreasing | • Valves not working • 4th stage piston worn • Fittings loose / leaking seals • Intake filter clogged • Intake extension kinked • Piston or piston rings worn | • Contact technical assistance • Contact technical assistance • Check for leaks with soapy water and eliminate them • Replace filter • Straighten, use stiffer pipe • Contact technical assistance |
| - Air smells of oil | • Cartridge filter exhausted • Piston rings worn | • Replace • Contact technical assistance |
| - Compressor overheats | • Direction of rotation wrong • Cooling tubes dirty • Incomplete valve closure (causing overload of another stage) | • Check direction of rotation • Contact technical assistance • Contact technical assistance |

7.6 - CHECKING AND CHANGING THE LUBRICATING OIL AND FILTER

After putting the compressor into service the oil filter and the lubricating oil itself must be changed after the first 50 (fifty) working hours.

Replacement of the filter and the lubricating oil must be done every 250 hours working hours or annually.

IMPORTANT:

The compressor must be placed on a solid surface with a tilt of no more than 5°.

DANGER:



Do not carry out these tasks if the compressor has only just shut down; wait for the compressor to cool.

Any oil spilt during the oil/filter change could cause personnel to slip; wear protective garments and anti-slip footwear and remove any traces of oil immediately.

Both oil and filter are classified as special wastes and must therefore be disposed of in compliance with the anti-pollution laws in force.

All maintenance work must be carried out with the compressor OFF and the power supply lead unplugged from the mains socket.

7.6.1 - OIL TABLE

| | | |
|------------------|--------|----------------------------------|
| Sump capacity | litres | 4,5 |
| Recommended oils | | COLTRI OIL CE750 CHEMLUBE 751 |

7.6.2 - CHECKING THE OIL LEVEL

The oil level must be checked every 5 working hours of the compressor.

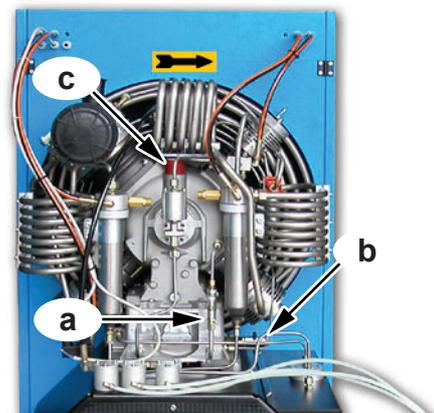
The oil level must be between the minimum and the maximum shown on the oil level indicator (a).

If the oil level is above the maximum level:

- position a recipient under the drain tap (b) so that the oil flows into the exhausted oil recipient;
- open the drain tap and let the oil flow out until the oil level returns within the max. and min. limits;
- close the drain tap (b).

If the oil level is below the minimum level:

- open the top-up plug (c);
- top up with oil until the level returns within the max. and min. limits;
- close the top-up plug (c).

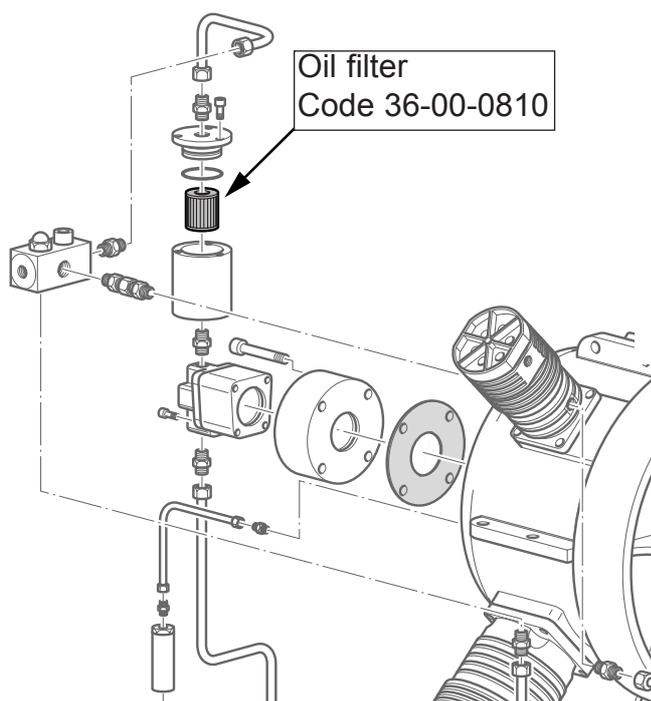
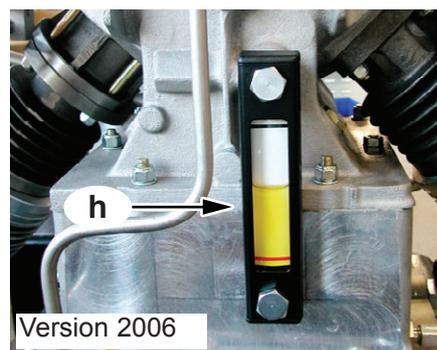
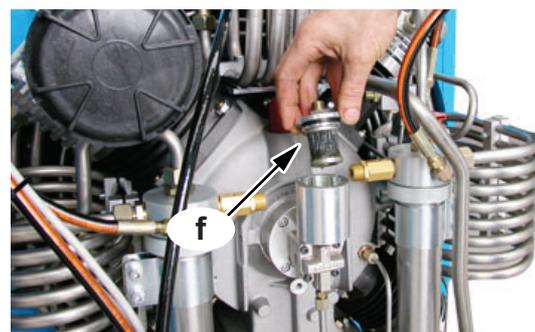
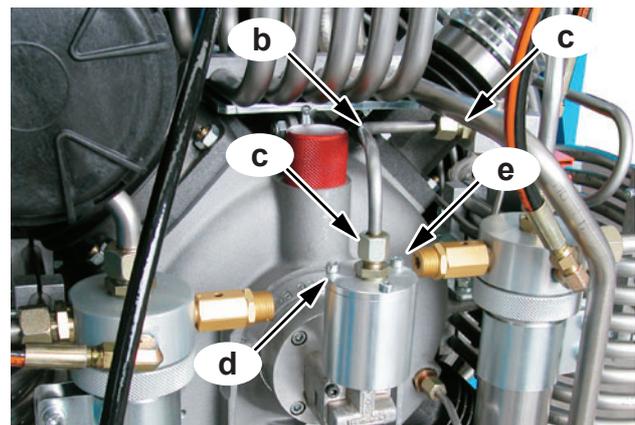
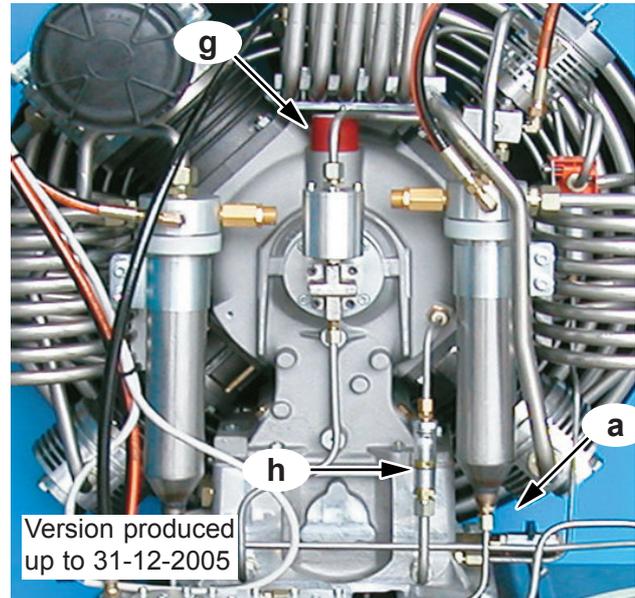


7.6.3 - CHANGING THE LUBRICATING OIL AND FILTER

The lubricating oil must be changed every 250 working hours or annually. Every time the lubricating oil is changed the oil filter must be changed too.

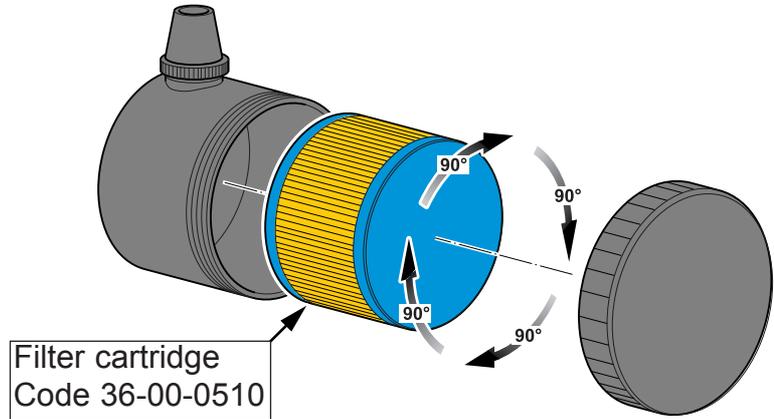
To change the oil proceed as described:

- position a recipient under the drain tap (a) so that the oil flows into the exhausted oil recipient (recipient capacity of at least 5 litres required).
- loosen the top-up plug (g).
- open the tap (a) and let all the oil flow out.
- unscrew the fittings (c) and remove the pipe (b).
- remove the fixing screws (e) and the cover (d).
- replace the filter (f) with a new one.
- re-close the plug (d) with the screws (e).
- put the pipe (b) back and tighten the fittings (c).
- close the drain tap (a).
- remove the top-up plug (g).
- fill the oil sump with 4.5 litres of oil via the top-up hole (see "6.6.1 Oil table").
- replace the oil top-up plug (g).
- switch on the compressor and run it on empty for 30 seconds.
- switch off the compressor and remove the plug from the mains socket.
- check the oil level (h); if it is not between the min. and max. limits proceed with the tasks described in paragraph "6.6.2 Checking the oil level".



7.7 - CHANGING THE INTAKE FILTER

After putting the compressor into service the intake filter must be changed after the first 50 working hours. The air filter must then be changed every 250 working hours or annually. Every 50 working hours rotate the filtration cartridge inside the filter 90°.



DANGER:



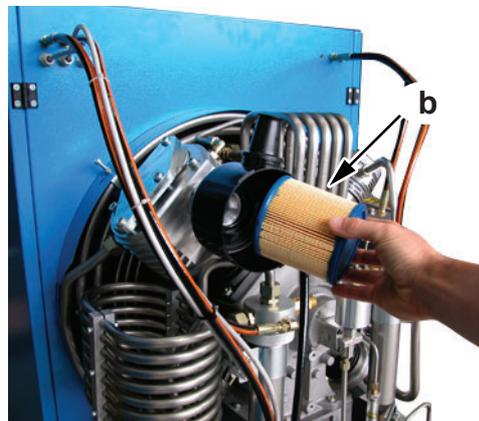
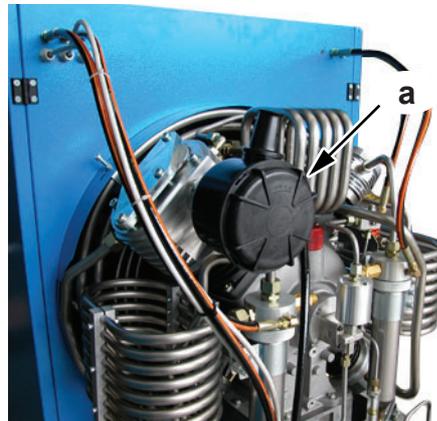
Do not carry out these tasks if the compressor has only just shut down; wait for the compressor to cool.

All maintenance work must be carried out with the compressor OFF and the power supply lead unplugged from the mains socket.

The air intake filter must be changed every 250 working hours or annually.

To change the filter proceed as follows:

- unscrew the air filter cover (a) by rotating it anti clockwise;
- remove the air filter cartridge (b);
- replace the cartridge with a new one;
- re-close the cover (a): screw it back on clockwise.



IMPORTANT:

If the compressor is used in a dusty environment the filter change interval should be reduced to every 100 hours.

7.8 - CHECKING THE SAFETY VALVE

The final safety valve protects bottles from being filled with air at too high a pressure; the valve setting is made at the time of testing the compressor.

The safety valve must be tested every time bottles are refilled.

After attaching the coupling to the bottle start the compressor with the bottle taps closed. Once you have checked that the safety valve trips at the right pressure (observe the gauge) you can open the taps and proceed with the refill.

IMPORTANT:

Should the safety valve fail to operate properly contact the AEROTECNICA COLTRI S.r.l. technical assistance service.

7.9 - TRANSMISSION BELTS

Belt tension must be checked monthly.

The transmission belts must be replaced every 500 working hours of the compressor.

DANGER:

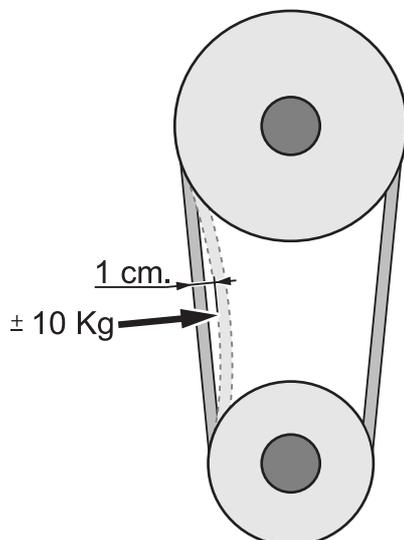


Do not carry out these tasks if the compressor has only just shut down; wait for the compressor to cool.

All maintenance work must be carried out with the compressor OFF and the power supply lead unplugged from the mains socket.

7.9.1 - CHECKING TRANSMISSION BELT TENSION

To check for proper transmission belt tension (a) exert a pressure of approximately 10 Kg on the belts; check that the belts do not flex by more than 1 cm with respect to their original position. Should they flex more than this the belts must be replaced.

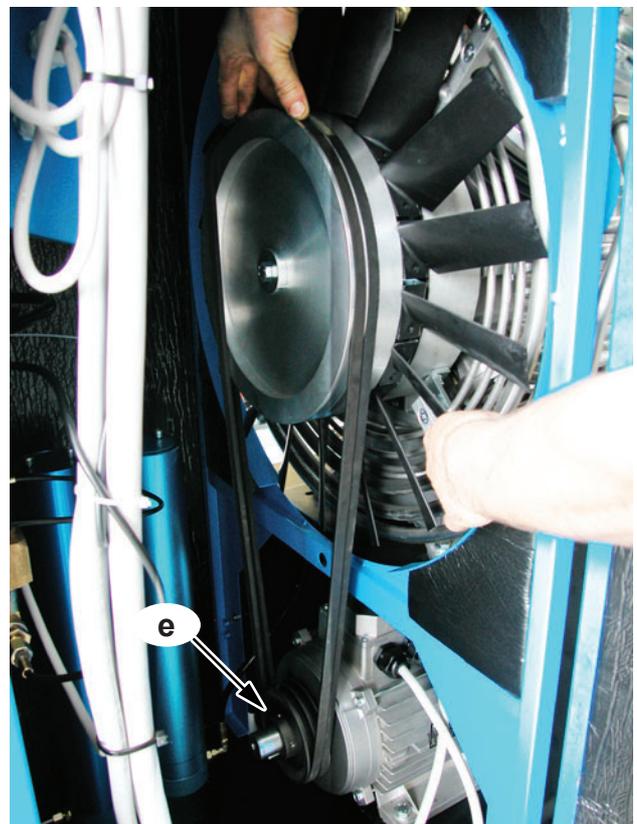
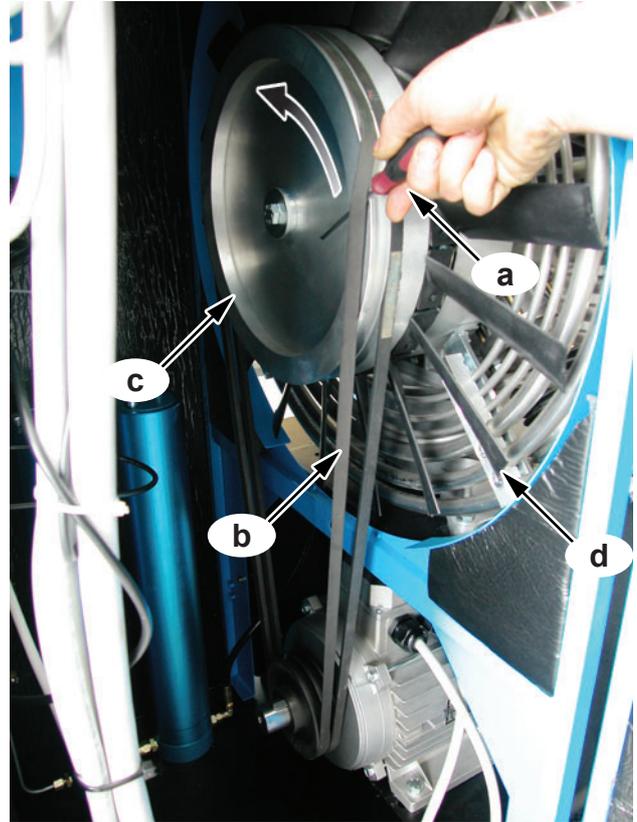


7.9.2 - CHANGING THE TRANSMISSION BELTS

To replace the transmission belts proceed as follows:

- insert a screwdriver (a) between the first belt (b) and the pulley (c) of the cooling fan (d);
- rotate the fan (d) anticlockwise until the belt comes out of the pulley groove;
- repeat the procedure on the second belt;
- change the belts with new ones: make sure the belt model and length are exact, check that the characteristics of the new belt are identical to those of the old one;
- insert the new belt on the internal groove of the electric motor pulley (e);
- insert the belt on the internal groove of the fan pulley while simultaneously turning the fan by hand until the belt slips perfectly into the groove of the pulley (second photo);
- check that the belt is inserted perfectly in the grooves of the two pulleys and that belt tension is correct;
- insert the second belt and carry out the same procedure described for the first belt.

If belt tension is not correct contact the AEROTECNICA COLTRI S.r.l. technical assistance service.



7.10 - CONDENSATE DISCHARGE

The condensate must be drained at the end of every working day.

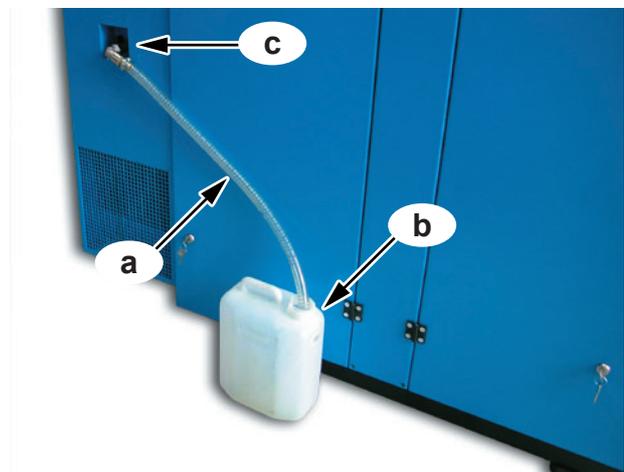
DANGER:

Do not carry out these tasks if the compressor has only just shut down; wait for the compressor to cool.

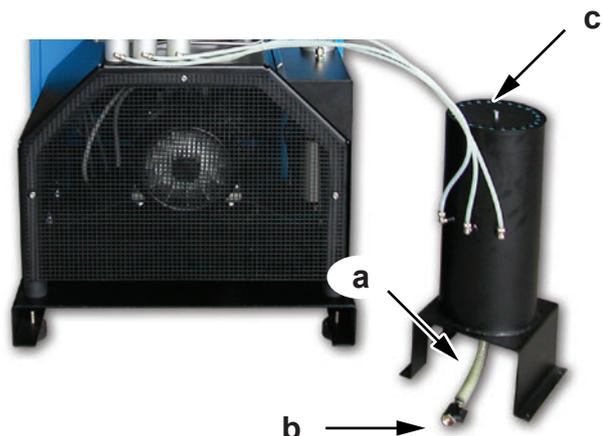
All maintenance work must be carried out with the compressor OFF and the power supply lead unplugged from the mains socket.

7.10.1 - SILENT AUTOMATIC CONDENSATE DISCHARGE

For the SILENT model proceed as follows: insert the condensate drain hose (a) into a condensate collection recipient (b) and open the drain tap (c). An outflow of condensate water with lubricating oil is normal during refills: the quantity will depend on the level of humidity in the air. The condensate must be disposed of as per the instructions in section "9.1 Waste disposal".

**7.10.2 - OPEN V.M. AUTOMATIC CONDENSATE DISCHARGE**

For the OPEN V.M. model proceed as follows: raise the container (c), insert the drain hose (a) in a condensate collection container or can, open the tap (b) and drain all the condensate; re-close the tap. An outflow of white emulsion with lubricating oil is normal during refills: the quantity depends on the level of humidity in the air. The condensate must be disposed of as per the instructions in section "9.1 Waste disposal". The condensate water must be drained every day, or every 6 working hours.



7.11 - ACTIVE CARBON FILTERS / MOLECULAR SIEVE

The active carbon filter must be replaced at intervals calculated on the basis of the characteristics of the environment in which the compressor is located. To calculate these intervals refer to the table below. The filter must nevertheless be replaced before the air becomes malodorous.

IMPORTANT:

If the compressor is used in an environment where CO (exhaust fumes) may be present it is compulsory to use CO-fixing filters (CARULITE® 300); these can be supplied on request.

DANGER:



Do not carry out these tasks if the compressor has only just shut down; wait for the compressor to cool.

All maintenance work must be carried out with the compressor OFF and the power supply lead unplugged from the mains socket.

Depressurise the entire compressor circuit before carrying out any maintenance tasks.

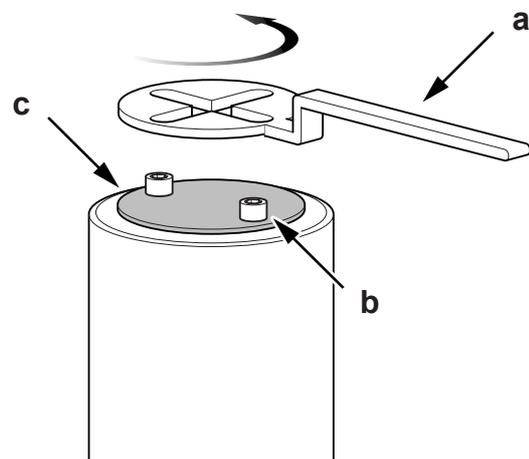
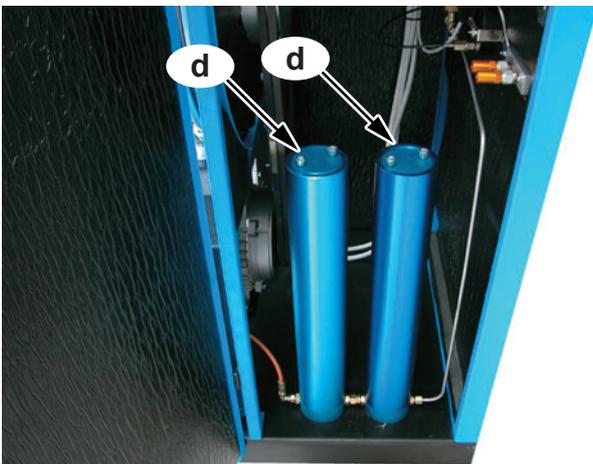
7.11.1 - FILTER REPLACEMENT FREQUENCY CALCULATION TABLE

| Temperature (°C) | Temperature (°F) | Correction factor | Filter duration (hours) | N° bottles (15-litre) (bombole a 200bar) |
|------------------|------------------|-------------------|-------------------------|--|
| 50 | 122 | 0,2 | (35x0,2)=7 | 84 |
| 40 | 104 | 0,34 | (35x0,34)=12 | 142 |
| 30 | 86 | 0,57 | (35x0,57)=20 | 239 |
| 20 | 68 | 1 | 35 | 420 |
| 10 | 50 | 1,85 | (35x1,85)=64 | 777 |
| 5 | 41 | 2,6 | (35x2,6)=91 | 1092 |
| 0 | 32 | 3,8 | (35x3,8)=133 | 1596 |

7.11.2 - CHANGING THE ACTIVE CARBON FILTERS

To change the active carbon filters (d) proceed as follows:

- vent all the compressed air inside the circuit;
- use the wrench (a) to apply leverage on the screw heads (b) of the plug (c) and rotate anticlockwise;



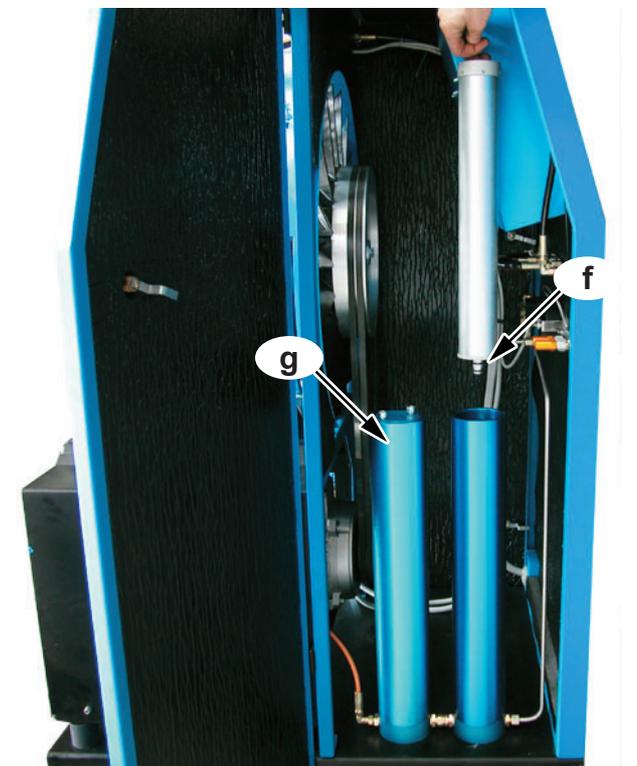
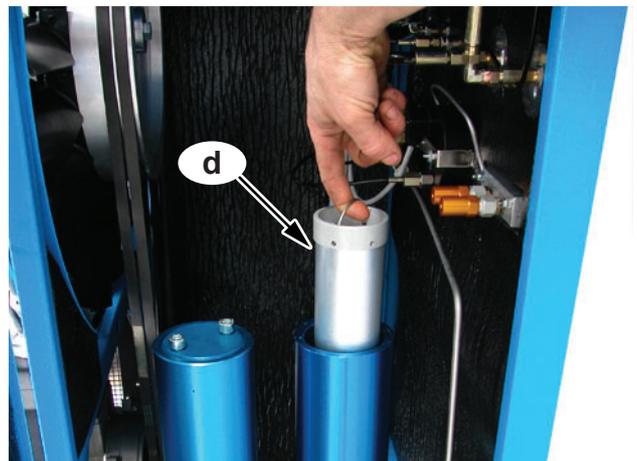
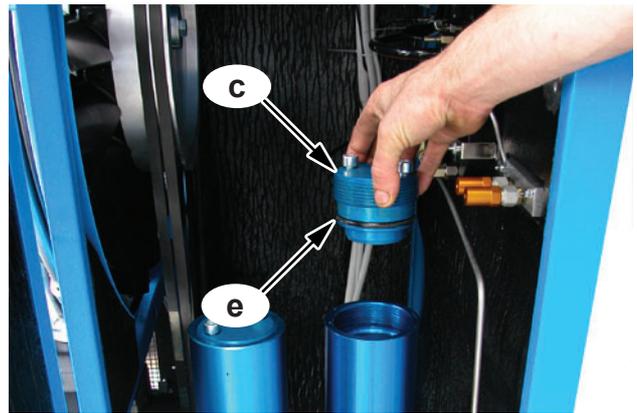
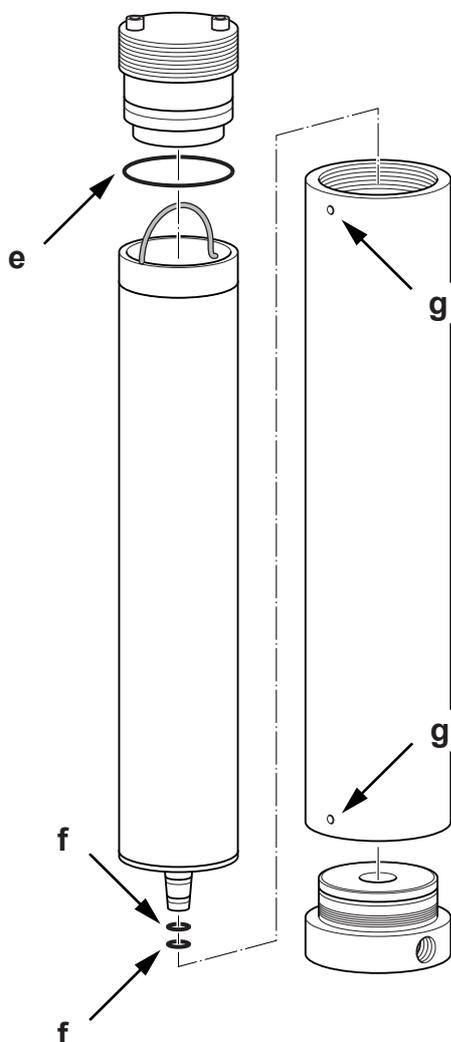
AEROTECNICA COLTRI® S.R.L.

- remove the filter plug (c);
- remove the active carbon filter cartridge (d) and replace it with a new one;
- replace the O-ring (e) on the plug (c) every time the filter is changed;
- close the filter and screw it on with the wrench (a).

There are sealing O-rings (e-f) on the plug and the filter cartridge; if these O-rings deteriorate, the air is released via the venting hole (g).

If you notice any venting from this hole replace the O-rings.

When replacing the O-rings observe the precautions described at the start of the section.

**WARNING:**

The active carbon filters are classified as special waste: they must be disposed of in compliance with the anti-pollution standards in force.

7.12 - CHANGING THE FLEX HOSES

IMPORTANT:

The hoses must be changed periodically (yearly or every 1000 hours) or when they show signs of abrasion/wear/damage.
The bending radius of the hoses must not be less than 250 mm.

DANGER:



Do not carry out these tasks if the compressor has only just shut down; wait for the compressor to cool.

All maintenance work must be carried out with the compressor OFF and the power supply lead unplugged from the mains socket.

Vent the air from the compressor before carrying out any maintenance tasks.

To change the bottle refill hoses proceed as follows:

- disconnect the bottle refill hoses by unscrewing the fittings (a) at their extremities (17 mm wrench);
- replace the old hoses with new ones;
- screw the hoses onto the connectors (a);
- use a dynamometric wrench to tighten the hoses to the compressor with a torque of 15 Nm.



8 - STORAGE

Should the compressor not be used, it must be stored in a dry sheltered area at an ambient temperature of between 0 °C and 40 °C.

Store the compressor away from sources of heat, flames or explosive.

8.1 - STOPPING THE MACHINE FOR A BRIEF PERIOD

If you do not intend to use the compressor for a brief period proceed with general cleaning.

8.2 - STOPPING THE MACHINE FOR A LONG PERIOD

If you do not intend to use the compressor for a long period, extract the active carbon filter cartridge.

Run the compressor for a few minutes without actually filling bottles so as to flush out all the residual condensate. Stop the compressor, disassemble the intake filter, restart the compressor and spray a few drops of oil into the air intake hole so that a light film of lubricant is aspirated and penetrates the interior of the compressor. Stop the compressor and refit the air intake filter. Clean the external parts: eliminate any moisture, salt or oil deposits. Protect the compressor from dust and water by storing it in a clean, dry place. Switch off the machine via the main switch and remove the plug from the mains power socket. Proceed with a thorough general clean of all machine parts.

During machine downtimes it is advisable to run the compressor for 20 minutes every 15 days.

9 - DISMANTLING AND PUTTING OUT OF SERVICE

Should you decide not to use the compressor or any of its parts any longer you must proceed with its dismantling and putting out of service.

These tasks must be carried out in compliance with the standards in force.

WARNING:



Should the compressor, or a part of it, be out of service its parts must be rendered harmless so they do not cause any danger.

WARNING:



Bear in mind that oil, filters or any other compressor part subject to differentiated waste collection must be disposed of in compliance with the standards in force.

9.1 - WASTE DISPOSAL

Use of the compressor generates **waste** that is classified as **special**. Bear in mind that residues from industrial, agricultural, crafts, commercial and service activities not classified by quality or quantity as urban waste must be treated as special waste. Deteriorated or obsolete machines are also classified as special waste.

Special attention must be paid to active carbon filters as they cannot be included in urban waste: observe the waste disposal laws in force where the compressor is used.

Bear in mind that it is compulsory to record loading/unloading of exhausted oils, special wastes and toxic-harmful wastes that derive from heavy/light industry processes. Exhausted oils, special wastes and toxic-harmful waste must be collected by authorised companies.

It is especially important that exhausted oils be disposed of in compliance with the laws in the country of use.

9.2 - DISMANTLING THE COMPRESSOR

IMPORTANT:

Disassembly and demolition must only be carried out by qualified personnel.

Dismantle the compressor in accordance with all the precautions imposed by the laws in force in the country of use. Before demolishing request an inspection by the relevant authorities and relative report.

Disconnect the compressor from the electrical system.

Eliminate any interfaces the compressor may have with other machines, making sure that interfaces between remaining machines are unaffected.

Empty the tank containing the lubricating oil and store in compliance with the laws in force.

Proceed with disassembly of the individual compressor components and group them together according to the materials they are made of: the compressor mainly consists of steel, stainless steel, cast iron, aluminium and plastic parts.

Then scrap the machine in compliance with the laws in force in the country of use.

IMPORTANT:

At every stage of demolition observe the safety regulations contained in this manual carefully.

10 - INSTRUCTIONS FOR EMERGENCY SITUATIONS

10.1 - FIRE

In the event of fire use a CO₂ extinguisher in compliance with the relevant standards in force.
Contact the fire brigade.



AEROTECNICA COLTRI[®] **S.R.L.**

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