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# MCH 8-11/EM MCH 13-16/ET

**USE AND MAINTENANCE MANUAL** 



High pressure compressors for pure breathing air and technical gases



HIGH PRESSURE COMPRESSORS FOR PURE BREATHING AIR AND TECHNICAL GASES

# MPORTANT BEFORE USING THE COMPRESSOR READ THIS MANUAL CAREFULLY

# AEROTECNICA COLTRI

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Dear Customer,

Thank you for choosing an **AEROTECNICA COLTRI** 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** 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** international technical service is able to provide you with assistance and spare parts as and when required.

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

Manufacturer's data:

#### AEROTECNICA COLTRI Spa.

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# AEROTECNICA COLTRI<sup>®</sup>

DECLARATION (€ CONFORMITY Italian DPR 459 of 24 <sup>th</sup> July 1996, appendix II, part A

It is hereby declared that he machine model:

# MCH 13-16/ET Standard MCH 8-11/EM Standard

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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# **AEROTECNICA COLTRI<sup>®</sup>**

# **QUICK GUIDE**



WARNING - This guide is intended only as a rapid introduction to use of the compressor. - This guide is not meant to replace the use and maintenance manual.

В

- This compressor must not be used before reading the entire use and maintenance manual.

#### Preliminary tasks:

- Position the compressor in the selected area (see chap "**5**")
- If necessary connect the air intake extension (see section "5.3.2")
- Check the oil level; if the compressor is new fill the oil sump with the oil supplied with the compressor (see section "7.6").
- Connect the electric motor to the mains power socket (see section "5.3.3");
- For compressors equipped with a three-phase electric motor, check that the cooling fan rotates in the direction indicated by the arrow on the cover; if it turns the other way invert two of the three phases on the mains power (see section "6.1.2").
- Connect up the refill hoses (see section "7.12").
- Check the safety valve is working (see section "7.8");
- Switch on the compressor with the end tap closed and check that air is discharged freely when the gauge value is equal to the valve setting (see section "6.4.1");

#### Bottle refill (see section "6.6"):

- fit the hose connector 1 on the bottle connector 3 (closed) (A);
- open the condensate discharge taps 2 and bottle taps 4;
- start the compressor (B);
- When refill is complete:
- close filling valve taps 2 and bottle taps 4 (A);
- switch off compressor, except for models with pressure switch (B):
- bleed the pressure from the filling valve tap via the bleed tap 5 (A);
- disconnect the connector 1 from the bottle (A).

#### Maintenance:

- After the first 5 working hours change the oil again (see section "7.6.3").
- Check the lubricating oil level every 5 hours (see section "7.6.2").
- Change the lubricating oil every 250 hours (see section "7.6.3").
- Periodically change the air intake filter (see section "7.7").
- Check the safety valve at every refill (see section "7.8").
- Check transmission belt tension and if necessary change them (see section "7.10").
- Discharge the condensate (see section "7.9").
- Periodically replace the active carbon filters / molecular sieve (see section "7.11").
- Periodically replace the refill hoses (see section "7.12").



Model: MCH 8-11/EM Standard



Model: MCH 13-16/ET Standard



Stop

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Start

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# AEROTECNICA COLTRI<sup>®</sup>

# 1 – GENERAL

#### **1.1 PRELIMINARY INFORMATION**

Do not destroy or modify the manual and update it with inserts published by producer only.

Machine type: High pressure compressor for breathing air and/or technical gases Model: MCH 13-16/ET Standard MCH 8-11/EM Standard Revision n°: 00 Manual version: 04/2007

Manufacturer's data: AEROTECNICA COLTRI Spa. Via Colli Storici, 177 25010 SAN MARTINO DELLA BATTAGLIA (BRESCIA) - ITALY Tel +39 030 9910301 - +39 030 9910297 Fax +39 030 9910283 http://www.coltrisub.it - http://www.coltrisub.com e-mail: coltrisub@coltrisub.it

Appendices:

- Safety regulations

#### **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.
- Company owners must ensure that the operator has the required training for operation of the compressor and that he/she has read the manual.



#### **1.3** IMPORTANT INFORMATION FOR THE USER

The information/instructions for compressor use contained in this manual only concern the:

#### AEROTECNICA COLTRI Mod.: MCH13-16/ET Standard. MCH8-11/EM Standard.

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.
1 I I I I I I I I I I I I I I I I I I I	
	Refers to dangerous situations that may occur during use of the compressor: aims to ensure worker safety.
	Refers to dangerous situations that may occur during use of the compressor: aims to prevent damage to objects and the compressor itself.
	Refers to dangerous situations that may occur during use of the compressor: aims 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 or careless preparation leads to improvisation, which is the cause of 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 Spa are covered by a 1 year warranty, the validity of which begins when the compressor is put into service as proven by the delivery document.

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

In replacing the faulty part AEROTECNICA COLTRI Spa 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 Spa in writing, even where agreements have already been made on the phone. AEROTECNICA COLTRI Spa cannot be held liable for any delays or failure to execute work.

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

**AEROTECNICA COLTRI Spa** guarantees that its compressors are free from defects design, workmanship and the used materials for a period of 1 year 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 Spa** within 2 month 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 Spa**.

#### Cap.I \_ General

## AEROTECNICA COLTRI®

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 Spa** 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 Spa**. 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 Spa** 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 Spa** is in any way liable to award compensation.

**AEROTECNICA COLTRI Spa** 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 Spa** technicians are at your disposal for all routine/unscheduled maintenance work.

Please forward your request for assistance to **AEROTECNICA COLTRI Spa** by sending a fax or e-mail to:

#### Fax +39 030 9910283

coltrisub@coltrisub.it

## 1.7 RESPONSIBILITY

**AEROTECNICA COLTRI Spa** 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 Spa;
- 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".



Failure to observe the regulations and instructions for use contained in this manual shall render the warranty null and void.

#### Cap.I \_ General

#### **1.8 PURPOSE OF THE MACHINE**

The compressors mod. **MCH8-11/EM MCH13-16/ET Standard** have been designed and built for the purpose of obtaining excellent quality breathing air by drawing it from the surrounding environment. The air, free from any harmful fumes, is passed through an intake filter and, after the filtration cycle, is stored in bottles constructed to contain air at high pressure.

The compressor can also be used to obtain other non-breathable gases for industrial use such as:

- Nitrogen
- Helium
- Natural gas
- Methane

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.



- Use only tested, certified bottles: do not exceed the working pressure indicated on them.

- Aspirate unpolluted air.
- Use the compressor in areas free from dust, risk of explosion, corrosion and fire.
- Improper use could have serious consequences for the user .
- Do not disconnect the hose from the fittings or the clamp when it is 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 "7.9 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 inadvisable.
- Never run the compressor when:
  - the power lead is damaged;
  - there is evident damage;
  - the covers/guards are removed.
- 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.
- 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** 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.



- 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 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, so as to prevent 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 compressors mod. **MCH8-11/EM MCH13-16/ET Standard** have been designed and built for the purpose of obtaining excellent quality breathing air by drawing it from the surrounding environment. The air, which must be free from any harmful fumes, 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				
Temperature ambient	(°C)	min. +5° - Max. +45°		
Air humidity	(%)	max.80%		
	rain			
Tolerated weather conditions	hail	None		
	snow			
Max tilt angle (bank)	%	6		

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

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

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 running and tested prior to delivery.

A new compressor must nevertheless be used with caution during the first 5 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 5 hours carry out - in addition to the scheduled maintenance - the following tasks:

- change the compressor oil;

- check and adjust nuts and bolts.

#### 1.10.1 Tightening torque values

The table shows tightening torques for bolts or hexagonal-head screws or socket screws lubricated with grease, except for specific cases indicated in the manual. Pipe connections (swivel nuts) should be finger tight plus an additional 1/2 turn.

Tightening torque values				
Thread	Max. torque			
M6 - 1/4"	<b>10</b> Nm ( <b>7</b> ft-lbs)			
M8 - 5/16"	<b>25</b> Nm ( <b>18</b> ft-lbs)			
M10 - 3/8"	<b>45</b> Nm ( <b>32</b> ft-lbs)			
M12 - 1/2"	<b>75</b> Nm ( <b>53</b> ft-lbs)			
M14 - 9/16"	<b>120</b> Nm ( <b>85</b> ft-lbs)			
M16 - 5/8"	200Nm (141ft-lbs)			

6 bolt and 4 bolt torque sequence



# 2 - BASIC INFORMATION ON THE COMPRESSOR

#### 2.1 DESCRIPTION OF THE COMPRESSOR

High pressure compressor for breathing air and technical gases.

Compatible process gases:

- Nitrogen
- Helium
- Natural gas
- Methane



# 2.2 IDENTIFICATION THE COMPRESSOR

Each compressor has an identification label (a) attached to its frame.

AEROTECN Via Colli Storici 17 25010 DESENZANO Tel. 030/9910301-9 Fax. 030/9910283	DD IG (BS) ITALY 10297
MODEL	MCH 13-16/ET STANDARD
TYPE	SC000296
S/N.	0010
YEAR	2005
MOTOR	ELECTRIC THREEPHASE
POWER	4KW



#### 2.3 GENERAL INSTRUCTIONS



- 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 in section "1.6 Assistance".
- 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 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 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 Emergency equipment

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 Checks and maintenance

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



#### **Cap.3** Safety regulation

# **AEROTECNICA COLTRI<sup>®</sup>**



- The EEC Machinery Directive 89/392 provides the following definitions (appendix 1, 1.1.1): «DANGEROUS ZONE»: any zone in side 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. 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 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 refer to "1.9 Where the machine may be used".

#### 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 its 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 Residual risk zones



In some compressor zones there remain residual risk s 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 compressor.

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 Heat-related dangers in compressor zone.

Use the machine with suitable safety devices and after switching off the machine wait 30 minutes for the machine to cool down before carrying out maintenance work.

- 4 Danger deriving from noise emitted by the compressor.
- 5 Fire risk.
- 6 Risk of being crushed or dragged in the transmission belt zone.
- 7 Danger of impact/abrasion with the cooling fan.
- 8 Danger of direct contact with operator if hose breaks during bottle refill.





# 3.3 SAFETY INFO LABELS: LOCATION



## **AEROTECNICA COLTRI<sup>®</sup>**

# Cap.3 \_ Safety regulation

#### 3.3.1 Safety info labels: description

a Safety valve info plate The safety valve is calibrated by the manufacturer to 225 bar, 300 bar or 330 bar. To check the safety valve refer to "7.8 Checking the safety valve".

а
<b>SAFETY VALVE</b>
225 BAR
<b>SAFETY VALVE</b>
300 BAR
<b>SAFETY VALVE</b>
330 BAR

**IMPORTANT** Should the safety valve fail to work pr operly contact the AEROTECNICA COLTRI technical assistance service.

# 2 -

1

a 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.

1

If, on a three-phase electric motor compressor, the fan rotates against the direction of the arrow invert two of the three phases on the main power lead.



3

- a Hands at risk of being crushed in transmission belt zone
- **b** Moving parts in transmission belt and cooling zone fan
- **c** Live wires: risk of electric shock
- **d** Forbidden to remove covers/guards
- e Forbidden to lubricate mechanical parts when they are moving: compressor must be switched off before any maintenance/lubrications tasks are carried out on it.
- f Safety gloves must be worn.
- g Safety goggles must be worn.
- h Hard hat must be worn.



- a Warning info plates about the dangers that derive from a lack of knowledge about the compressor and its functions and the consequent risks.
- **b** Read the use and maintenance manual carefully before using the compressor.

b а

MCH8-11/EM - MCH13-16/ET Standard Use and Maintenance Manual

#### Cap.3 \_ Safety regulation

#### **AEROTECNICA COLTRI<sup>®</sup>**



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# 3.4 GENERAL SAFETY REGULATIONS

#### 3.4.1 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 running.

# 3.4.2 Fire extinguishers and first aid

- Check that a fire extinguisher is present. Make sure all personnel 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
1 A A A A A A A A A A A A A A A A A A A	compressor.											

#### **Cap.3** Safety regulation

#### MAINTENANCE PRECAUTIONS 3.5

#### 3.5.1 Warning signs

Before doing any maintenance work, stop the engine/motor 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.



#### 3.5.2 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.

#### 3.5.3 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.

#### 3.5.4 Keeping 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.

#### 3.5.5 Periodic 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 Crankcase, crankshaft, cylinders, pistons

The crankcase is made of aluminium alloy; the flanges with roller bearings on the filter sides and ball bearings on the fan side that support the crankshaft are kept oil-tight with the crankcase by O-rings between flange and crankcase and the oil retainer between flange and motor shaft.

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

The cylinders are made of cast iron, the pistons are made of aluminium and feature traditional multiple piston rings. The high pressure stage piston has a special anti-wear lining. The relative cylinder is self-lubricating.

#### 4.1.2 Valves

The heads set features outlet and intake valves. The 1<sup>st</sup> stage head is reed valve type and includes both intake and pressure. The intake and pressure valves are inserted directly in the respective threaded seats of the 2 nd and 3 rd stage heads. (Pressure valve of 3<sup>rd</sup> stage have no threads).

#### 4.1.3 Safety valves

The safety valves are pre-adjusted during assembly of the compressor and prevent it being damaged in the event of a malfunction. The max pressure, as a function of the valve, as follows:

1 <sup>st</sup> stage safety valve	8 bar - (114 PSI)
2 <sup>nd</sup> stage safety valve	50 bar - (710 PSI)
3 <sup>rd</sup> stage safety or final valve	225 bar - (3200 PSI)
	300 bar - (4300 PSI)
	330 bar - (4700 PSI)



It is strictly forbidden to carry out any adjustments to the valve to raise its factory preset pressure.

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

#### 4.1.4 **Pressure maintenance valve**

This valve is fitted after the final filter. When the compressor is switched on it keeps internal system pressure at 100  $\pm$ 20 bar so as to remove as much water as possible from the air.

#### 4.1.5 Lubrication

Splash lubrication occurs by oil thrower pins screwed onto the 2 nd and 3 rd stage connecting rods. Third stage lubrication is of the oil vapour type.

#### 4.1.6 Cooling tubes

The cooling pipes are made of stainless steel.

#### 4.1.7 Frame, guards

The compressor and motor (electric or internal combustion type) are mounted on a welded steel frame that has been painted with epoxy resins. The frame consists of painted panelling with a handle for the purpose of moving it. Stainless steel frame available on request.

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#### Cap.4 \_ Technical data

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#### 4.2 MACHINE PARTS

- 1 Frame
- 2 Cover
- **3** Motor (electric or internal combustion type)
- 4 Compressor
- 5 Pressure gauge
- 6 Intake filter
- **7** Final condensate separator
- 8 Active carbon air filter / molecular sieve
- 9 1<sup>st</sup> stage
- 10 2<sup>nd</sup> stage
- 11 3rd stage
- 12 Monobloc
- 13 Oil filler plug
- 14 Safety valve
- 15 Maintenance valve
- 16 Cooling fan
- 17 Belt
- 18 Anti-vibration device
- 19 Condensate discharge taps
- 20 Oil drain plug





# 4.3 TECHNICAL CHARACTERISTICS

#### 4.3.1 MCH 13/ET Standard



Motor	Electric, 3-phase
Motor power	<b>4</b> kW - <b>5,5</b> Hp
	<b>4,8</b> kW - <b>6,5</b> Hp
Voltage and frequency	<b>230</b> ∨ - <b>50</b> Hz
	<b>400</b> ∨ - <b>50</b> Hz
	<b>230</b> ∨ - <b>60</b> Hz
	<b>400</b> ∨ - <b>60</b> Hz
	<b>440</b> ∨ - <b>60</b> Hz
	<b>480</b> ∨ - <b>60</b> Hz
Unit pumpung	<b>1350</b> rpm
Peak non-continuous pressure	225bar (3200PSI)
	<b>300</b> bar ( <b>4300</b> PSI)
	<b>330</b> bar ( <b>4700</b> PSI)
Delivery rate	<b>215</b> I/min
	<b>13</b> m³/h
	<b>7,5</b> CFM
Refill time 10	<b>9</b> min.
151	<b>14</b> min.
Noise pressure level (ISO 3746)	<b>80,7</b> dB(A)
Noise power level (ISO 3746)	<b>93,2</b> dB(A)
Dry weight	<b>99</b> kg - <b>218</b> lbs
Dimensions	880x640x480 mm - 34x25x18 inches



Should the compressor be used in a working environment where the level of noise to which the operators are exposed to on a daily basis exceeds 80 dBA, the employer must apply all necessary health and safety measures.

It is especially important that operators wear ear defenders to protect them from noise.

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#### 4.3.2 MCH 16/ET Standard



Motor	Electric, 3-phase
Motor power	<b>5,5</b> kW - <b>7,5</b> Hp <b>6,6</b> kW - <b>9</b> Hp
Voltage and frequency	230∨ - 50Hz 400∨ - 50Hz 230∨ - 60Hz 400∨ - 60Hz 440∨ - 60Hz 480∨ - 60Hz
Unit pumpung	<b>1550</b> rpm
Peak non-continuous pressure	225bar (3200PSI) 300bar (4300PSI) 330bar (4700PSI)
Delivery rate	265 l/min 16 m³/h 9 CFM
Refill time 10l 15l	8 min. 11 min.
Noise pressure level (ISO 3746) Noise power level (ISO 3746)	<b>82,3</b> dB(A) <b>93,2</b> dB(A)
Dry weight	<b>109</b> kg - <b>240</b> lbs
Dimensions	880x640x480 mm - 34x25x18 inches



Should the compressor be used in a working environment where the level of noise to which the operators are exposed to on a daily basis exceeds 80 dBA, the employer must apply all necessary health and safety measures.

It is especially important that operators wear ear defenders to protect them from noise.

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#### 4.3.3 MCH 8/EM Standard



Motor	Electric, single-phase
Motor power	<b>3</b> kW - <b>4</b> Hp
Voltage and frequency	<b>230</b> ∨ - <b>50</b> Hz
	<b>230</b> ∨ - <b>60</b> Hz
Unit pumpung	<b>900</b> rpm
Peak non-continuous pressure	225bar (3200PSI)
	<b>300</b> bar ( <b>4300</b> PSI)
	<b>330</b> bar ( <b>4700</b> PSI)
Delivery rate	<b>135</b> I/min
	<b>8</b> m³/h
	<b>5</b> CFM
Refill time 10	<b>15</b> min.
151	<b>22</b> min.
Noise pressure level (ISO 3746)	<b>78</b> dB(A)
Noise power level (ISO 3746)	<b>88</b> dB(A)
Dry weight	<b>99</b> kg - <b>218</b> lbs
Dimensions	880x640x480 mm - 34x25x18 inches



Should the compressor be used in a working environment where the level of noise to which the operators are exposed to on a daily basis exceeds 80 dBA, the employer must apply all necessary health and safety measures.

It is especially important that operators wear ear defenders to protect them from noise.

MCH8-11/EM - MCH13-16/ET standard Use and Maintenance Manual

#### 4.3.4 MCH 11/EM Standard



Motor	Electric, single-phase
Motor power	<b>4</b> kW - <b>5,5</b> Hp
Voltage and frequency	<b>230</b> ∨ - <b>50</b> Hz
	<b>230</b> ∨ - <b>60</b> Hz
Unit pumpung	<b>1200</b> rpm
Peak non-continuous pressure	225bar (3200PSI)
	<b>300</b> bar ( <b>4300</b> PSI)
	<b>330</b> bar ( <b>4700</b> PSI)
Delivery rate	<b>195</b> l/min
	<b>11</b> m³/h
	7 CFM
Refill time 10	<b>11</b> min.
151	<b>16</b> min.
Noise pressure level (ISO 3746)	<b>78</b> dB(A)
Noise power level (ISO 3746)	<b>88</b> dB(A)
Dry weight	99 kg - 218 lbs
Dimensions	880x640x480 mm - 34x25x18 inches



Should the compressor be used in a working environment where the level of noise to which the operators are exposed to on a daily basis exceeds 80 dBA, the employer must apply all necessary health and safety measures.

It is especially important that operators wear ear defenders to protect them from noise.

#### Cap.5 \_ Handling and installation

# AEROTECNICA COLTRI®

# **5 - HANDLING AND INSTALLATION**

#### 5.1 UNPACKING

**Standard** series compressors are sent fully assembled, with the flex hoses separate.

The compressor is packed in a cardboard box on a pallet 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:

- two 1200 mm refill hoses with filling valves
- use and maintenance manual
- use and maintenance manual appendix (safety regulations)
- lubricating oil (2 litres)
- active carbon and molecular sieve filte cartrige.



#### 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 or transpallet (of suitable load-bearing capacity): the forks must be positioned in the support feet on which the europallet is positioned.

If the compressor is not on a pallet it can be handled manually via the carry handles (**a**) on the frame.



	Proceeding with compressor.	the	utmost	when	lifting,	transferring	and	positioning	the
WARNING	Manual lifting of individual worker	the co shou	ompresso Id lift mo	or requi re than	res at le 30 Kg.	east two worke	ers ar	nd in any cas	e no

#### 5.3 INSTALLATION



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

#### 5.3.1 Positioning

- Position the compressor in the designated area and check it is level. For compressor dimensions please consult section 4.3 "Technical characteristics".

- 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 extension pipe to fitting.

- Fit the supplementary intake filter on the extremity 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.

Do not aspirate harmful gases or exhaust fumes.

#### 5.3.3 Electrical connection

The compressor is supplied with an electrical lead and, depending on the model, with a plug (see diagram at right).

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.







Before inserting the plug, check that the electrical system complies with the standards in force in the country of installation. A proper earth (ground) system is an essential safety requisite.

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

The mains power connection plug must be type-approved in compliance with the relevant standards and have an ON-OFF switch (not supplied).

#### Cap.6 \_ Using the compressor

# AEROTECNICA COLTRI®

# 6 - USING THE COMPRESSOR

#### 6.1 PRELIMINARY CHECKS BEFOR USING FOR THE FIRST TIME

The operator must check that the compressor is supplied with:

- use and maintenance manual;

- the appendix to the use and maintenance manual (where applicable);

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".

#### 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 it will 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. Replace parts where necessary or contact **AEROTECNICA COLTRI**.

#### 6.2.1 Lubricating oil level check

Check that the lubricating oil level (a) is within acceptable limits (i.e. must be higher than half the length of oil visual indicator tube (a).

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".



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#### 6.2.2 Checking that the refill flex 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 (OPTIONAL)

WARNING This type of control panel is designed to be wall mounted (not on the machine).

It is, on request, possible to equip the compressor with a remote control panel for the compressor. The panel features the following controls:

#### a Pressure switch

(U)`

The automatic shutdown pressure switch (a) indicates compressor shutdown pressure. Shutdown pressure is set by acting on the regulator and is displayed on the indicator.

When the compressor arrives at the set pressure it shuts down automatically.

## b Hour counter

The hour counter (b) indicates the number of working hours of the compressor: this provides a time reference for scheduled maintenance.

## c ON pushbutton

To start the compressor press the green ON push-

button. The compressor will then run until the pressure that has been set on the adjustable pressure switch (a) is reached or until the safety valve release over pressure.

## d OFF pushbutton

Press the red OFF pushbutton (d) to stop the compressor.

## e Manual condensate discharge button

Pressing the yellow manual condensate discharge button (e) drains the condensate collected in the special recipient during use of the compressor (no further tasks required: drainage interval managed with the pressure switch timer).

To drain the condensate see section "7.9 - Condensate discharge".

## f Emergency pushbutton

In an emergency situation stop the compressor by pressing the red emergency pushbutton (f). Check that the emergency shutdown pushbutton is working properly at the start of each working day by switching on the compressor and pressing it. If the compressor fails to shut down immediately after pressing the emergency pushbutton disconnect the compressor from the power supply and contact AEROTECNICA COLTRI.

WARNING It is forbidden to alter pressure parameters without authorisation from AEROTECNICA COLTRI.

Any unauthorised modifications shall render the warranty null and void.



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#### 6.4 PRELIMINARY TASKS

#### 6.4.1 Checking the safety valves

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), 300 (4300 PSI) and 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 the refill hose and relevant fitting 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.

	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.
	Should bottles show evident signs of internal/extern al corrosion, do not refill them even if they have been tested.
	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.
IMPORTANT	Should the safety valve fail to work properly contact the AEROTECNICA COLTRI assistance service.

# **AEROTECNICA COLTRI<sup>®</sup>**

# 6.5 STARTING AND SHUTTING DOWN

1

**IMPORTANT** These tasks must be carried out by qualified personnel who have been trained to use the compressor.

#### 6.5.1 Starting and shutting down the MCH 8-11/EM Standard

Before starting the engine open the condensate discharge points to prevent a "strained" start.

- check the voltage and that there is a proper earth contact

- connect the compressor up to the mains power supply.

- press the start pushbutton (a) to its ON position.

- close the condensate discharge points.

To switch the motor off again press the start pushbutton (a) to the OFF position.



**IMPORTANT** For models with three-phase electric motor check th at the direction of rotation of the electric motor is as indicated by the arrow on the cover (if it is not refer to "6.1.2 Checking for proper electrical connection").

#### 6.5.2 Starting and shutting down the MCH 13-16/ET Standard

Before starting the engine open the condensate discharge points to prevent a "strained" start.

- check the voltage and that there is a proper earth contact.

- connect the compressor up to the mains power supply.

- turn the socket switch (a) to its ON position.

- for models with three-phase electric motor check that the direction of rotation of the electric motor is as indicated by the arrow on the cover (if it is not refer to "6.1.2 Checking for proper electrical connection").

To switch the motor off again turn the socket switch (a) to its OFF position.

#### 6.5.3 Starting and shutting down with control panel

For models supplied with a control panel proceed as follows:

- to switch on the compressor press the green pushbutton (a).

- to switch off the compressor press the red pushbutton (b).

- In an emergency situation press the red emergency pushbutton (c).

In any case the compressor will shut down automatically on reaching the pressure set on the pressure switch (d).





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The available bottle refill connectors are:



#### Cap.6 \_ Using the compressor

#### AEROTECNICA COLTRI®

To refill bottles proceed as follows:

- Fit the hose connector (a) to the bottle valve (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 valve (d) by rotating it anticlockwise.
- Start the compressor.
- Open the valve (e) by rotating it anticlockwise.
- Start the compressor.
- When the refill has been completed shut the compressor down.
- Close valves (d) and (e) by rotating them clockwise.
- Open the bleed valve (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.





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.

IMPORTANT	If an emergency situation arises during refill shut down the compressor immediately
	(see "6.5 Starting and shutting down").
	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.



# 7.1 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 Spa. 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 chapter "11 Maintenance register" of this manual.

# 7.3 UNSCHEDULED WORK

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.

#### Cap.7 \_ Maintenance

# 7.4 SCHEDULED MAINTENANCE TABLE

	5	10	30	40	50	250	500	1000	2000	3000	4000
Maintenance	hours										
Condensate discharge	0	0			0						
Automatic shutdown check		0			0						
Lubricating oil level check					0						
Main functions check						0					
Clean condensate discharge valves						0					
Condensate discharge O-rings											
Condensate discharge valves											
Belt wear and tension						0					
Clean separator filter element						0					
Oil change											
1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> -stage valves							0				
HP water/oil separator											
HP filter body											
1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> -stage segments											
Check and replace HP flex hoses							0				
Fitting/hose leak							0				
General check-up							0				
Pumping unit, general overhaul								0			
1 <sup>st</sup> and 2 <sup>nd</sup> stage safety valves											
Safety valves											
○ Checking and cleaning ● Ch	ange										

# 7.5 TROUBLESHOOTING

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

# 7.6 CHECKING AND CHANGING THE LUBRICATING OIL

After putting the compressor into service the lubricating oil must be changed after the first 50 working hours. The lubricating oil must be changed 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	1,5
Recommended oils		COLTRI OIL CE750 CHEMLUBE 751 ANDEROL 755

#### 7.6.2 Checking the oil level

Check that the level of lubricating oil (**a**) is within the allowed limits (it must be above half the length of the level indicator tube a) 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".



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#### 7.6.3 Changing the lubricating oil

The lubricating oil must be changed every 250 working hours or annually. To change the oil proceed as described:

- position a recipient under the drain plug (a) so that the oil flows into the exhausted oil recipient (recipient capacity of at least 3 litres required).
  open the top plug (b).
- open the plug (a) and let all the oil drain out.
- close the drain plug (a).
- fill the oil sump with 1.5 litres of oil from top oil plug (see "7.6.1 Oil table").
- close the oil top plug (b).
- switch on the compressor and run it depressure area for 30 seconds.
- switch off the compressor and remove the plug from the power socket.
- check the oil level (**a**); if it is not between the min. and max. limits on the oil visual indicator tube (**a**) proceed with the tasks described in paragraph "7.6.2 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.

Rotate the filtration cartridge in the filter by 90° every 50 hours.





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:

- turn the air filter cover (a) by rotating it anticlockwise;
- 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.

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# 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, using the gauge, that the safety valve trips properly at maximum working pressure, open the taps and start the refill.

# IMPORTANT Should the safety valve fail to operate properly contact the AEROTECNICA COLTRI technical assistance service.

# 7.9 CONDENSATE DISCHARGE

**IMPORTANT** The condensate must be discharged at the end of every working day.

DANGER

Do not carry out these tasks if the compressor has only ju st 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.

Condensation accumulates in the condensate separator; the condensate must be discharged every 10-15 minutes of compressor use.

To discharge the condensate open the drain valves (a) and collect the condensate in an appropriate recipient.

Close the valves.

For models with a control panel (**b**) condensate discharge occurs automatically every 7 minutes.

The yellow TEST PURGE pushbutton (e) must be pressed every day to make sure that the discharge valve is working properly. Use a plastic pipe to connect the discharge fittings (c) to a recipient or bowl for collection of the condensate and check this container periodically to stop it overflowing. Should you wish to effect a manual discharge use the drain taps (d).

Every 250 hours it is necessary to replace the **SINTERED FILTER** inside the solenoid valve fitting (f).

Condensate must be disposed of according to the instructions shown in section "9.1 Waste disposal".





# 7.10 TRANSMISSION BELT

Belt tension must be checked monthly.

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



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 Checking transmission belt tension

To check the tension on the belt (**a**) exert a pressure of approximately 10 Kg on the belt; check that the belt does not flex by more than 1 cm with respect to its original position.

Should it flex more than this replace the belt.



## 7.10.2 Changing transmission belt

To change a belt proceed as follows:

- insert a screwdriver (**a**) between the belt (**b**) and the motor pulley (**c**).

- take the belt out of the pulley groove.

- replace the belt with a new one, making sure that model and length are correct: check that the characteristics of the new belt are identical to the old one.

- insert the belt in the groove of the motor pulley (c).
- insert the belt in the groove of the compressor pulley (d): turn the pulley by hand until the belt slips into the pulley groove perfectly (second diagram).

- check that the belt is inserted perfectly in the grooves of both pulleys and that belt tension is correct.

If the tension of the new belt still fails to comply with the necessary requisites contact **AEROTECNICA COLTRI** assistance service.





#### 7.11 ACTIVE CARBON FILTER / 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.

If the compressor is used in an environment where CO (exhaust fumes) may be present it is compulsory to use CO-fixing filters; these can be supplied on request.
For compressors used in the USA and CANADA the use of LAWRENCE FACTOR filtration cartridges is recommended.
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

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.

Temp. (°C)	Temp. (°F)	Correction factor	Filter duration (hours)				
			MCH-8	MCH-11	MCH-13	MCH-16	MCH-18
50	122	0,2	(70x0,2)=14	(55x0,2)=11	(50x0,2)=10	(40x0,2)=8	(36x0,2)=7
40	104	0,34	(70x0,34)=24	(55x0,34)=19	(50x0,34)=17	(40x0,34)=14	(36x0,34)=12
30	86	0,57	(70x0,57)=40	(55x0,57)=31	(50x0,57)=28	(40x0,57)=23	(36x0,57)=20
20	68	1	70	55	50	40	36
10	50	1,2	(70x1,2)=78	(55x1,2)=66	(50x1,2)=60	(40x1,2)=48	(36x1,2)=43
5	41	1,4	(70x1,4)=98	(55x1,4)=77	(50x1,4)=70	(40x1,4)=56	(36x1,4)=50
0	32	1,6	(70x1,6)=112	(55x1,6)=88	(50x1,6)=80	(40x1,6)=64	(36x1,6)=57

#### 7.11.1 Filter replacement frequency calculation table

#### 7.11.2 Changing the active carbon filter / molecular sieve

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

- vent all the compressed air inside the circuit.
- use the tool (**b**) to lever the screw heads (**d**) on the plug (**c**) and rotate counter clockwise.





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## **AEROTECNICA COLTRI®**

- remove the filter plug (c).
- unscrew the cartridge (e) from the plug (c).
- replace the cartridge (e) with a new one.
- screw the new cartridge onto the plug (c).
- close the filter plug (c) and tighten with the wrench (**b**).

There are O-rings on the filter plug and cartridge (f-g). If these O-rings deteriorate air is vented through the cap (c).

If you notice any venting replace the O-rings.

When changing the O-rings observe the precautions described at the beginning of the relevant section of the manual.







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

1

**IMPORTANT** It is essential that there be a filtration cartridge inside the active carbon filters (a) every time the compressor is used.

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#### 7.12 CHANGING THE FLEX HOSES

	The hoses must be changed periodically (every 3 years or ever 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.
	Tank refill pressure is very high; therefore, before refilling the tanks check that the hoses are perfectly connected and in good condition. Check also that the taps on any unused hoses are closed properly so as to prevent the dangers that derive from hose whiplash.
	When the tanks are being refilled unauthorised personnel must remain at a distance of at least 3 metres.

It is strictly forbidden to disconnect the hoses from the fittings or refill tap when the machine is under pressure.

To change the bottle refill hoses proceed as follows: - disconnect the bottle refill hoses by unscrewing the fittings (**a**) (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 on 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.

AEROTECNICA COLTRI<sup>®</sup> Cap.9 \_ Dismantling and putting out of service

# 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.



#### 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.

# **11 - MAINTENANCE REGISTER**

## **11.1 ASSISTANCE SERVICE**

Customers continue to receive assistance after the purchase of a compressor. To this end **AEROTECNICA COLTRI** has created an assistance network covering the entire country.

# IMPORTANTOur qualified technicians are at your disposal at any time to carry out maintenance<br/>work or repairs; we use only original spare parts so as to ensure quality and<br/>reliability.

## **11.2 SCHEDULED MAINTENANCE**

The scheduled maintenance programme is designed to keep your compressor in perfect working order.

Some simple tasks, described in this manual, can be carried out directly by the customer; others, instead, require that the work be carried out by trained personnel. For the latter we recommend you always contact our assistance network.

This section provides a simple tool with which to request assistance and register completed scheduled maintenance work.

Start-up and maintenance checks/tasks, once completed by our qualified technician, are registered in this maintenance chapter by way of an official stamp, signature and inspection date; the number of working hours is also registered.

The maintenance schedules/coupons easily let you know when our assistance service should be contacted to carry out work.

## **11.3** USING THE COMPRESSOR UNDER HEAVY-DUTY CONDITIONS

Where compressors are used in particularly difficult conditions (high levels of pollution, presence of solid particulate in suspension etc.), scheduled maintenance tasks must be carried out more frequently as per the advice given by our assistance network.

## **11.4 THE CUSTOMER CARE CENTRE**

Our qualified technicians are constantly in contact with the head offices of our company where there is an assistance network coordination and support centre, better known as the Customer Care Centre. To contact us:

Telephone: +39 030 9910301 +39 030 9910297 Fax: +39 030 9910283 E-mail: coltrisub@coltrisub.it

# **11.5** SCHEDULED MAINTENANCE REGISTRY COUPONS

Type of work and notes	Date
	Assistance service stamp
	Maintenance
	technician's signature

Type of work and notes	Date
	'Assistance' service stamp
	Maintenance
	technician's signature
(	

Type of work and notes	Date
	'Assistance' service stamp
	Maintenance
	technician's signature

Type of work and notes	Date
	'Assistance' service stamp
	Assistance service stamp
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T-t	
Type of work and notes	
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	technician's signature

Type of work and notes	Date
	'Assistance' service stamp
	Maintonanao
	technician's signature
Type of work and notes	Date
	'Assistance' service stamp
	Maintenance
	technician's signature
Type of work and notes	Date
	'Assistance' service stamp
	Maintenance
	technician's signature

12 - NOTES


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