

# **COLTRI SUB<sup>®</sup>**

## **OWNER'S MANUAL**

**high pressure compressor  
Mod. MCH-6**

AEROTECNICA COLTRI S.r.l.<sup>®</sup>  
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# AEROTECNICA COLTRI s.r.l.

CE CONFORMITY DECLARATION  
(conform at point A 2nd law 89/392/CEE)

declare under its responsibility that the machine:  
high pressure breathing air compressor

model \_\_\_\_\_

serial no. \_\_\_\_\_

construction year \_\_\_\_\_

is built conform at the security law 89/392, included 91/368 - 93/44 - 93/68

EN 50081-2 (agosto 1993)  
EN 50082-2 (marzo 1995)

DESENZANO DEL GARDA, \_\_\_\_\_

**Il Presidente del consiglio  
d'amministrazione**

*Carlo Coltri*  




# WARNING



This manual is to be read very carefully before transporting, installing or performing any maintenance on the machine.

Keep it close to the machine, where users, people in charge of transportation, installation, maintenance can reach it.

This manual provides instructions for transportation, installation, regulations and machine use. It provides information pertinent to maintenance, to order parts, personnel instructions and handling of hazardous residues.

Anyhow, it is important to remember that the instruction manual cannot replace the user's experience. For some difficult maintenance operations, this manual is a reminder of the main operations to be performed by the user with specific knowledge acquired for instance at the manufacturer's facilities.

This manual is a part of your machine; it must be kept close to the compressor in a container specially dedicated to it until the machine is disposed of. In the event of losing it, get a new copy from the manufacturer.

Make sure that all the users fully understand the regulations and the meaning of the symbols on the machine.

Accidents can be avoided by following the instructions contained in this manual. These have been extracted from the Extract for machines 89/392/CEE and subsequent addenda.

Always stick to national safety regulations.

Do not damage or remove the tags and shields, especially those imposed by legal requirements.

This manual represents the most recent version technical information available by the time the unit is commercialized. Therefore, it cannot be considered inadequate only because there has been an update reflecting new findings of techniques.

The manufacturer has the right to update the productions and instruction manuals without the obligation to update previous versions, except in very special cases.

In order to receive manuale updates or inserts, please contact the numbers on the cover.

Contact the manufacturer for further information and for suggestions for the improvement of the instructions manual.

LABEL APPLIED ON BELT GUARD

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*MODEL*

MCH-6

*TYPE*

PORTABLE

*S/N*

0226

*YEAR*

1998

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## 1 WARRANTY AND ASSISTANCE

### 1.1 Warranty

AEROTECNICA COLTRI guarantees its products for twelve months from the moment the compressor is started.

The warranty starts when the compressor is shipped.

The warranty will be acknowledged only if the machine has been used properly, following the instructions in this manual and the periodical maintenance.

The defective parts that have failed during the warranty period will be replaced or repaired at Aerotecnica Coltri's expense at the location at S. Martino della Battaglia.

The expenses for transportation and shipping of spare parts will be the buyer's responsibility.

Whenever any of Aerotecnica Coltri's technicians are required at the buyer's location, the traveling and accomodation expenses will be the buyer's responsibility.

Any other eventual will be discussed based on every particular case.

All maintenance materials are excluded from the warranty, and so are damaged parts because of improper use of the compressor.

The repairs and/or replacements during the warranty period will not extended the duration of the same.

The acceptance of the warranty excludes compensation because of lack of production.

### 1.2 Assistance

Technicians at AEROTECNICA COLTRI are available for any maintenance procedure, either emergency or scheduled one.

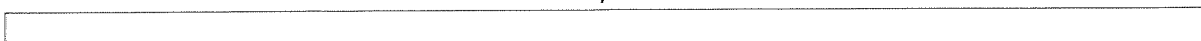
The maintenance request must be forwarded at AEROTECNICA COLTRI through the phone or fax.



## 2 TECHNICAL DATA

MODEL	DIMENSION (in)	WEIGHT kg	POWERED BY	POWER (HP)
MCH 6/SH	30 x 12 x 15	39	Gasoline Engine HONDA GX 160	5,5
MCH 6/EM	26,5 x 12 x 15	36	Electric single Phase Motor: - 220 V, 50 Hz - 220 V, 60 Hz - 110 V, 60 Hz	3
MCH 6/ET	26,5 x 12 x 15	36	Electric Motor Three Phase: - 230 V, 50 Hz - 400 V, 50 Hz - 220 V, 60 Hz - 440 V, 60 Hz	4

TECHNICAL FEATURES	MCH6/SH	MCH6/EM	MCH6/ET
Construction	High pressure compressor, air cooled 4 compression stages		
Peak pressure non continuous use	bar (psi) 330 (5000)		
Maximum pressure Non continuous use	bar (psi) min: 20 (300) max: 250 (3700)		
Cfm	3,5 cfm	2,8 cfm	2,8 cfm
Cylinder diameter (in)	3,1 - 1,5 - 0,76 - 0,38		
Piston run (in)	0,52		
Intermediate pressure	1st. stage 2 <sup>nd</sup> stage 3 <sup>rd</sup> stage 4 <sup>th</sup> stage	57 psi 285 psi 1000 psi 5000 psi	
Transmission	The entire system uses ball needle bearings		
Lubrication	Splash lubricated		
Recommended oils	Coltri special oil Shell Corena P150 Mobil Rarus 829 Anderol 500		
Oil Viscosity	Summer: Over 50 F: SAE 20W/40		
Maximum inclination of compressor with Oil level at maximum:	5 degrees		



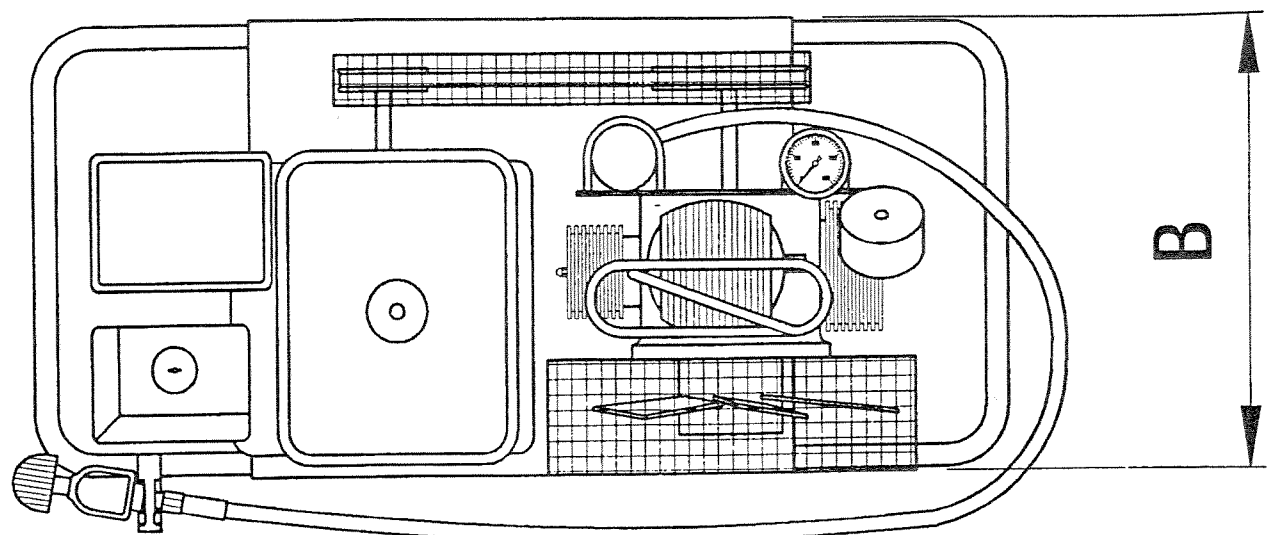
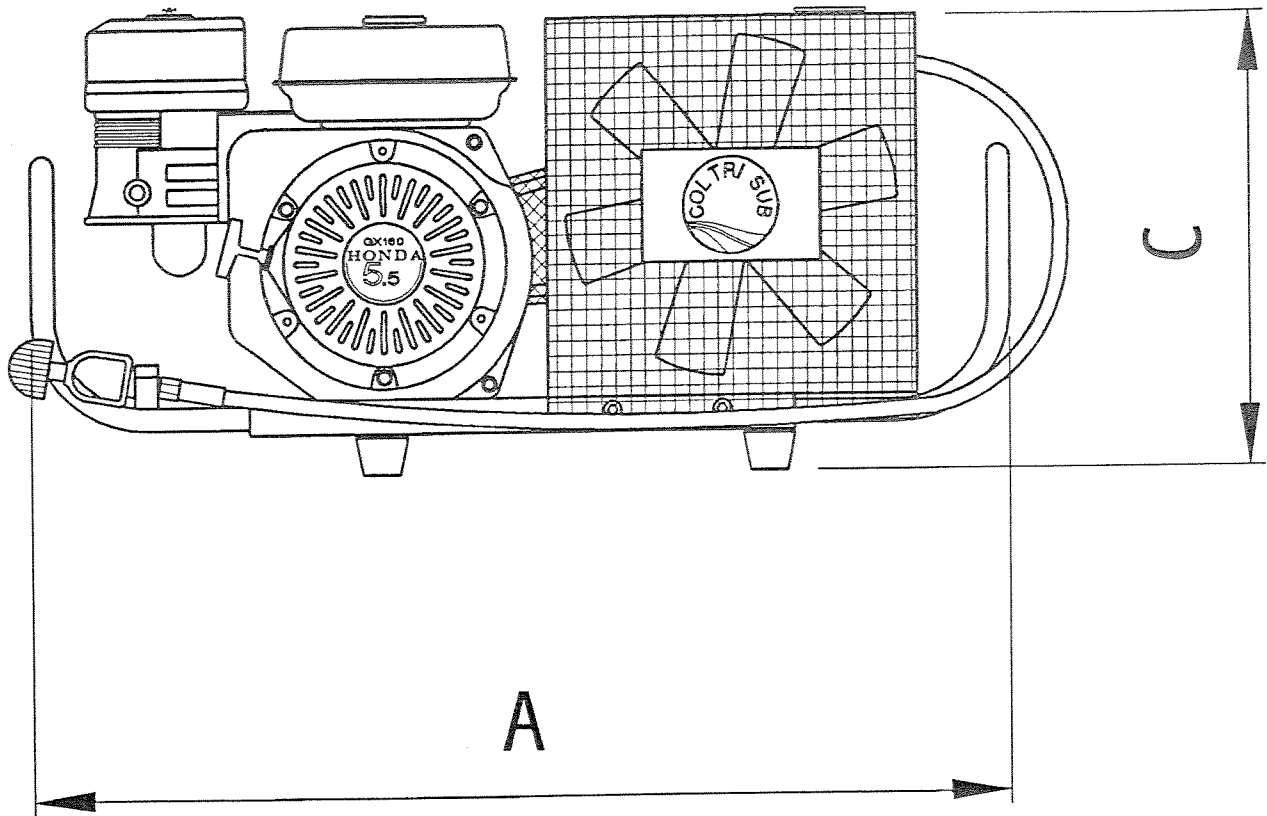


Fig. 01a MCH6/SH

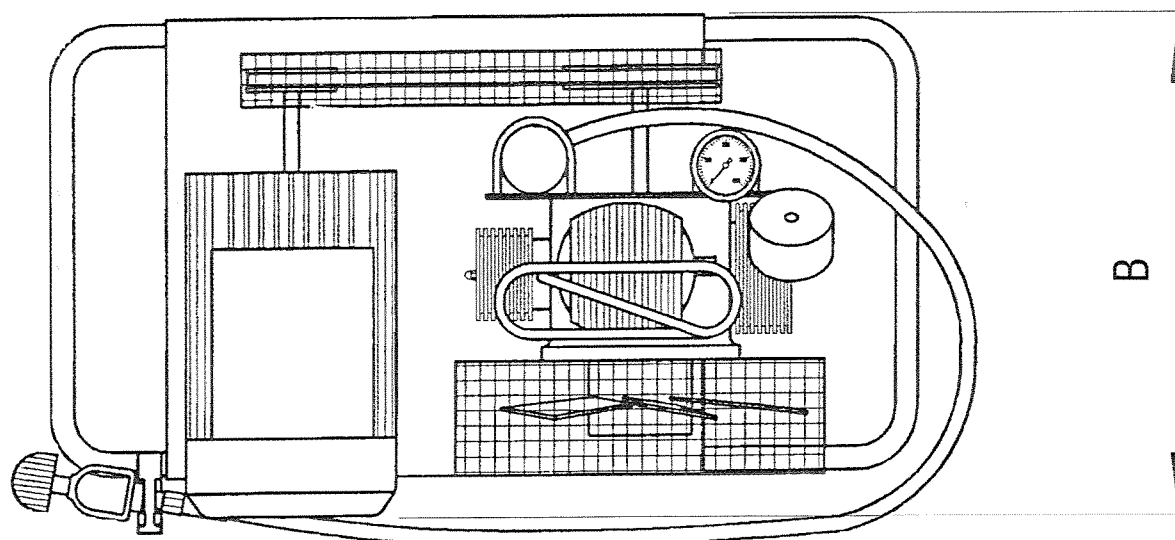
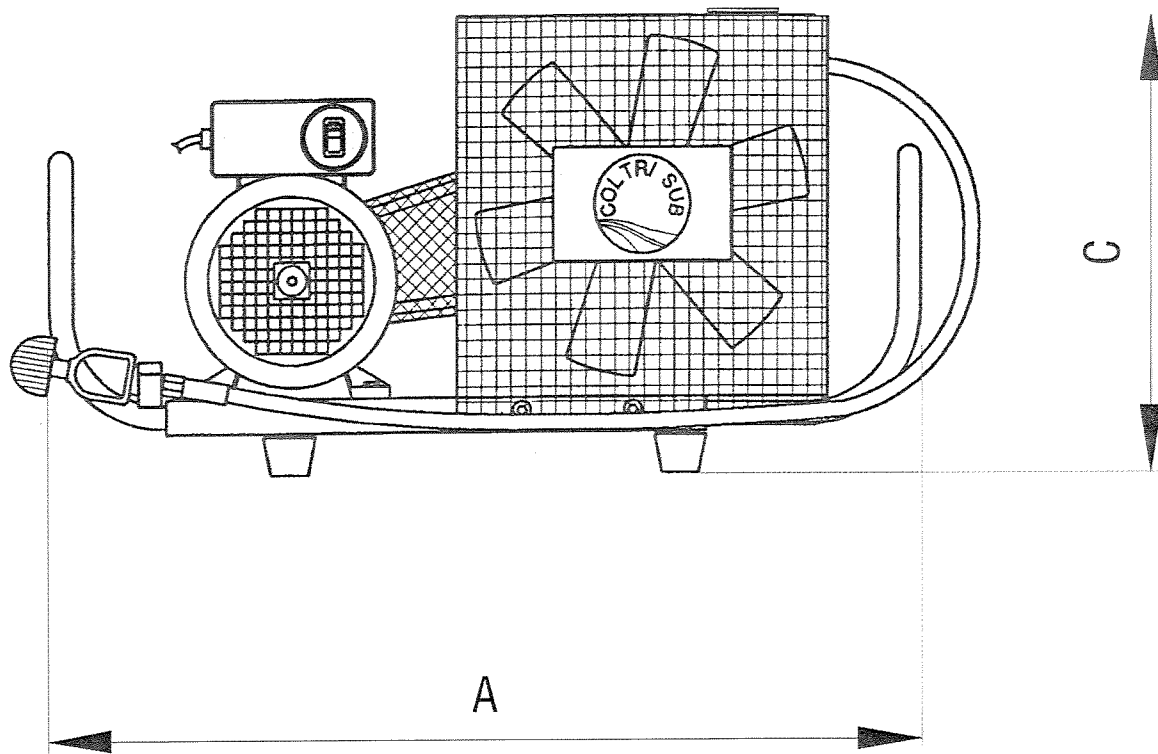


Fig. 01b MCH6/EM e MCH6/ET

### 3 GENERAL WARNING

#### 3.1 Expected use



The compressor model MCH6 is expected to be used to obtain maximum quality breathing air, withdrawing it from surrounding environment, free of pollutants, through an intake filter and compressing it into tanks specifically built to withstand high pressure air, after the filtration process.



#### WARNING

USE ONLY TANKS THAT HAVE BEEN HYDROSTATICALLY TESTED. DO NOT OVER-PRESSURIZE THE TANKS. PRESSURIZE ONLY TO WORKING PRESSURE, STAMPED ON SHOULDER OF THE TANKS.



#### WARNING

USE ONLY NON POLLUTED AIR. USE THE COMPRESSOR ONLY IN CLEAN ENVIRONMENTS AMBIENTS WHERE THERE ARE NOT DUST PARTICLES. BE CERTAIN NOT TO USE THE COMPRESSOR WHERE THERE IS DANGER OF AN EXPLOSION, IN CORROSIVE ENVIRONMENTS OR FIRE HAZARD CONDITIONS.



#### WARNING

FOR COMPRESSORS GASOLINE OR DIESEL OPERATED, USE ONLY IN OPEN ENVIRONMENTS. DO NOT USE IN ENCLOSED PLACES. MAKE SURE THAT THE AIR INTAKE IS AWAY FROM EXHAUST FUMES FROM THE COMBUSTION ENGINES. PLEASE CHECK PARAGRAPH 4.2, ABOUT POSITIONING.



#### WARNING

DO NOT OPERATE COMBUSTION OPERATED COMPRESSORS ABOARD OF VESSELS.



**WARNING**

ANY USE DIFFERENT THAN THE RECCOMENDED ONE COUL CAUSE GRAVE CONSE-  
QUENCES TO THE USER.



**WARNING**

DO NOT UNPLUG UNIT WHILE UNDER PRESSURE.



**WARNING**

CHANGE PURIFICATION FILTER CARTRIDGES REGULARLY, AS INDICATED IN PARA-  
GHRAPHS 6.6 AND 6.8



**WARNING**

DRAIN THE COMPRESOR REGULARLY, AS INDICATED IN PARAGRAPH 6.7



**WARNING**

UNPLUG THE COMPRESSOR IF:  
- THERE IS A PROBLEM DURING THE NORMAL OPERATION  
- PREVIOUS TO CLEANING  
- AFTER OPERATION



**WARNING**

NEVER UNPLUG THE UNIT BY PULLING THE CORD. PULL THE PLUG AVOIDING BY  
HAND. DO NOT USE EXTENSION CORDS.



**WARNING**

DO NOT START THE COMPRESSOR IF:  
- THE ELECTRIC CORD IS DAMAGED  
- THE MACHINE SHOWS EVIDENT DAMAGE



**WARNING**

COMPRESSORS GASOLINE OR DIESEL OPERATED, FOLLOW THE INSTRUCTIONS STRICTLY.



**WARNING**

DO NOT REFILL THE GASOLINE OR DIESEL TANKS WHILE THE COMPRESSOR IS RUNNING. ALL MAINTENANCE OPERATIONS MUST BE PERFORMED WITH THE COMPRESSOR IN A NON-RUNNING STATE, UNPLUGGED AND DEPRESSURIZED.



**WARNING**

WAIT ABOUT 30 MINUTES AFTER TURNING THE MACHINE OFF BEFORE PERFORMING ANY MAINTENANCE ON COMPRESSOR TO AVOID BURNS.



**WARNING**

THE FILL WHIP MUST BE IN GOOD SHAPE, ESPECIALLY AT THE FITTINGS. THE PLASTIC SHEATH COVERING THE FILL WHIP MUST BE IN GOOD CONDITION AND SHOULD NOT SHOW ANY SIGN OF DAMAGE, INCLUDING PINHOLES. OTHERWISE, MOISTURE CAN CORRODE THE STEEL BRAID, REDUCING ITS RESISTANCE. THE FILL WHIP MUST BE REPLACED PERIODICALLY (ANNUALLY) OR BEFORE IF IT SHOWS SIGNS OF DETERIORATION. FAILURE TO OBSERVE THIS RULE CAN RESULT IN PHYSICAL DAMAGE TO THE OPERATOR. MAKE SURE THAT THE MINIMUM CURVATURE RADIUS IS NOT LESS THAN 10 INCHES.

In order to ensure the maximum confidence, AEROTECNICA COLTRI has carefully selected materials and components utilized to build its compressors, subjecting them to regular tests previous to their use. A good service period depends also on good maintenance procedures, according to the instructions in this manual.

All elements used to build the machines, the wiring and command systems have been designed with a safety factor included to resist worse conditions to those hereby indicated. Materials are the best quality ones and its stocking and use at our shops are constantly controlled in order to guarantee the absence of damage or malfunction.

**KEEP IN MIND, THOUGH:**



**CAUTION**

OPERATORS MUST BE FAMILIAR WITH THE COMPRESSOR USE BEFORE THEY ATTEMPT ITS USE. WE STRONGLY RECOMMEND READING AND UNDERSTANDING TECHNICAL INFORMATION CONTAINED IN THIS MANUAL PREVIOUS TO COMPRESSOR USE.



**CAUTION**

IT IS VERY IMPORTANT TO FOLLOW ALL THE WARNINGS, ESPECIALLY THOSE IN PARAGRAPH 3.1: COMPRESSOR USE.



**CAUTION**

DO NOT USE THE COMPRESSOR UNDER CONDITIONS OR FOR PURPOSES DIFFERENT THAN THE ONES INDICATED IN THIS MANUAL. AEROTECNICA COLTRI CANNOT BE HELD RESPONSIBLE FOR DAMAGES OR INCONVENIENCES DUE TO THE IMPROPER USE OF THE MACHINE, OR IGNORING THE WARNINGS INCLUDED IN THIS MANUAL.



**CAUTION**

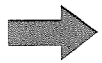
CHECK THE TIGHTNESS OF THE FITTINGS, USING SOAPY WATER TO ELIMINATE POSSIBLE LEAKS.



**CAUTION**

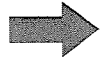
DO NOT WELD THE TUBING ON COMPRESSOR





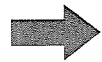
**CAUTION**

DO NOT EMPTY TANKS COMPLETELY, NOT EVEN DURING WINTER STOCKING, TO AVOID GETTING MOISTURE IN TANKS.



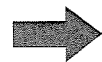
**CAUTION**

DO NOT MODIFY OR TAMPER WITH INSTRUMENTS AND/OR COMPONENTS PROVIDED WITH UNITS AND OBJECT OF THIS MANUAL, ESPECIALLY THOSE ITEMS RELATED TO SAFETY, SUCH AS SYMBOLS AND WARNINGS.



**CAUTION**

DO NOT OPERATE UNITS IN A WAY DIFFERENT TO THE ONE INDICATED IN THIS MANUAL. DO NOT IGNORE SAFETY PRECAUTIONS.



**CAUTION**

SAFETY INSTRUCTIONS ARE ESPECIALLY IMPORTANT BESIDES INSTRUCTIONS INDICATED IN THIS MANUAL AND COMBUSTION ENGINES MANUALS.

TABLE: ENVIRONMENTAL DATA		
Temperature	(degrees C)	min -20° - max +45°
Air moisture	(%)	max 80
Maximum wind during use	(ft/sec)	max 45
Atmospheric agents	Rain Snow Hail	None





### 3.2 General Safety Rules





Machine rule No. 89/392/CEE uses the following definitions:

«**HAZARDOUS ZONE**», any zone inside and/or close to a unit where the presence of an exposed person constitutes a risk to the person's health or safety.

«**EXPOSED PERSON**», any person partially or totally inside of a hazardous zone.

«**OPERATOR**», person or persons in charge of installing of utilizing, perform maintenance, cleaning repairing or transporting a unit.


 The employer must inform accurately all the operators about the risks, especially those concerning noise, about the personal protection devices, and about the existing national or international rules to avoid personal damage.  
All operators must respect the national or international protection rules at the final destination fo the unit.


 Prior to starting any work on a compressor, each operator must be familiar with the unit operation and must read und understand all the information included in this manual.

**Do not replace any of the compressor parts unless specifically authorized by the manufacturer.**

The use of parts or materials different than those recommended by the manufacturer in this manual can be hazardous to the operators or the unit itself.

Any modification to the unit not specifically authorized by the manufacturer relieves Aerotecnica Coltri of any legal or civil responsibility.

 It is expressly prohibited to remove or tamper with any of the safety devices.

 Any operation to install o maintain the unit must be performed with the unit in no running state, without electric or mechanical power.

- ☞ Once the cleaning of the machine is performed, the operator has to verify that there are no damaged, worn out or loose parts (if there were any, ask for assistance from a maintenance technician).  
It is especially important to check the state of the flexible tubing and other parts subject to wear. Check for oil and/ or other hazardous substances leaks.  
Do not re-start the machine if there were any of these leaks. Make sure to resolve the situation before restarting the machine.  
In the event of finding the presence of leaks, the operator must attach a sign to the control panel, warning about the unit's state and prohibiting the machine's re-start.
- ☞ Do not stick hands, screwdrivers, or other tools in any moving parts.
- ☞ Do not use flammable fluids in the cleaning process.
- ☞ Check the nameplates periodically and restore them if necessary.
- ☞ The operator's working area must be kept clean and tidy to allow free movement.
- ☞ Operators must try to avoid dangerous operations, or in uncomfortable positions, because of loss of balance.
- ☞ Do not climb on the machine.
- ☞ Operators must be careful not to get any parts of their body or clothing trapped in the moving parts of the compressors. Hats are recommended for long hair.
- ☞ Operators should avoid the use of chains, bracelets and rings.
- ☞ Operators must wear personal protection items, such as aprons, gloves, helmets eye-glasses, working shoes, ear protection.
- ☞ The working area must have proper lighting, to ensure a good operation. Too much or too little illumination may result in a hazardous condition.
- ☞ **Always respect the instructions, warnings and rules contained in this manual.**

### 3.3 Noise

To relieve the noise produced by the compressor, locate it at a height of 5 feet from the floor and 3 feet away from walls.

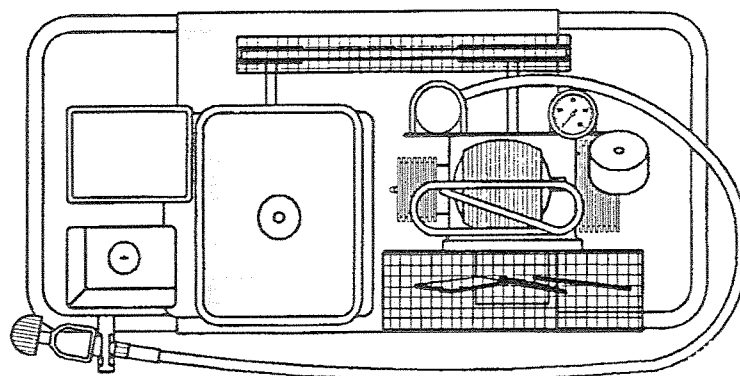
The next table reports the noise levels according to the rule ISO3476 (Determination of noise level coming from noise producing machines- surveillance method). Measurement of maximum normalized noise pressure referring to rule ISO 11202 (In situ measurement with simplified procedure to determine ambient correction factor) for model MCH6/SH.

	Operator Position	
Machine	LpA	LwA
MCH6 /SH	87 dBA	100,7 dBA

For models MCH6/ET-EM the measurement of noise pressure and normal level at the operator's situation referring Rule ISO 11202 (In-situ measurement with simplified procedure to determine the ambient correction factor), as it can be seen in figure 02.

The tests have been performed with the machine operating in a continuous mode activating the tank filling function.

	Operator Position
Machine	LpA
MCH 6/ EM	81,7 dBA
MCH 6/ ET	83,0 dBA



Operator  
Position

Fig. 02 Noise reduction

### 3.4 Machine Area Diagram

The MCH6 is a unit that can be operated either with a combustion or an electric motor. Therefore, the term "Operator" used in paragraph 3.2 describes the following figures:

☞ The person assigned to maintenance is the one who transports, installs, starts, regulates, cleans and exchanges parts. This person must be qualified, must have had training, and specialty courses and must have the experience to transport, install, start and service units operated with a pneumatic, electric or mechanical machine. The person assigned to the machine maintenance must also be trained through a course taught by AEROTECNICA COLTRI.

☞ The person assigned to the unit operation is in charge of working on the machine; this person must fill tanks, as indicated in paragraph 5.4, the command operations in paragraph 5 and to start the combustion engine, according to chapter No. 5 and the manual of the engine.

☞ It is prohibited that the person in charge of the operation of the machine performs any other type of operation, but the ones indicated before or to operate in areas different than the one indicated with an X in figure 03.

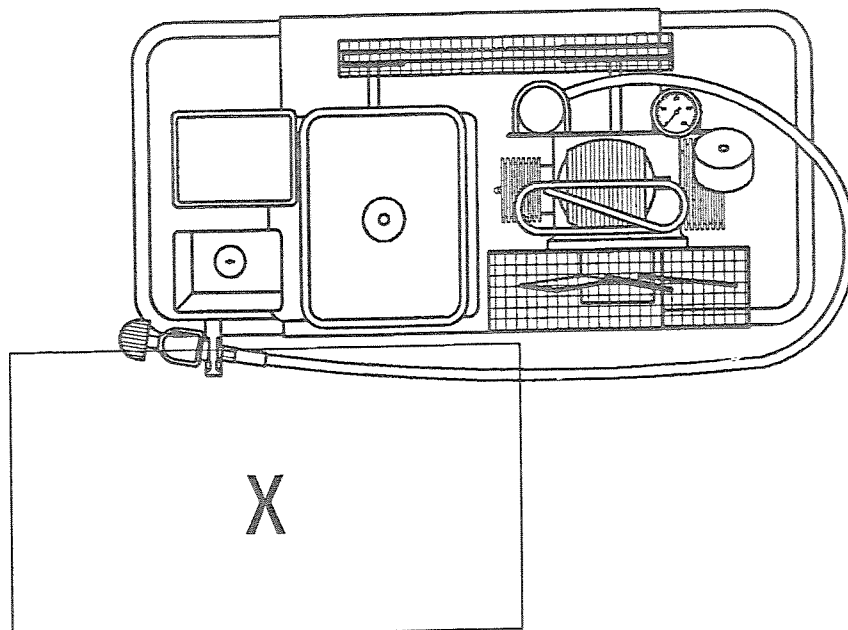


Fig. 03

Compressor MCH6 has 5 main parts figure 04:

1. Motor (Combustion in MCH6/SH, electric in MCH6/EM and MCH6/ET);
2. Pump
3. Cooling Fan
4. Drive belt with shroud
5. Frame, with handles for transportation

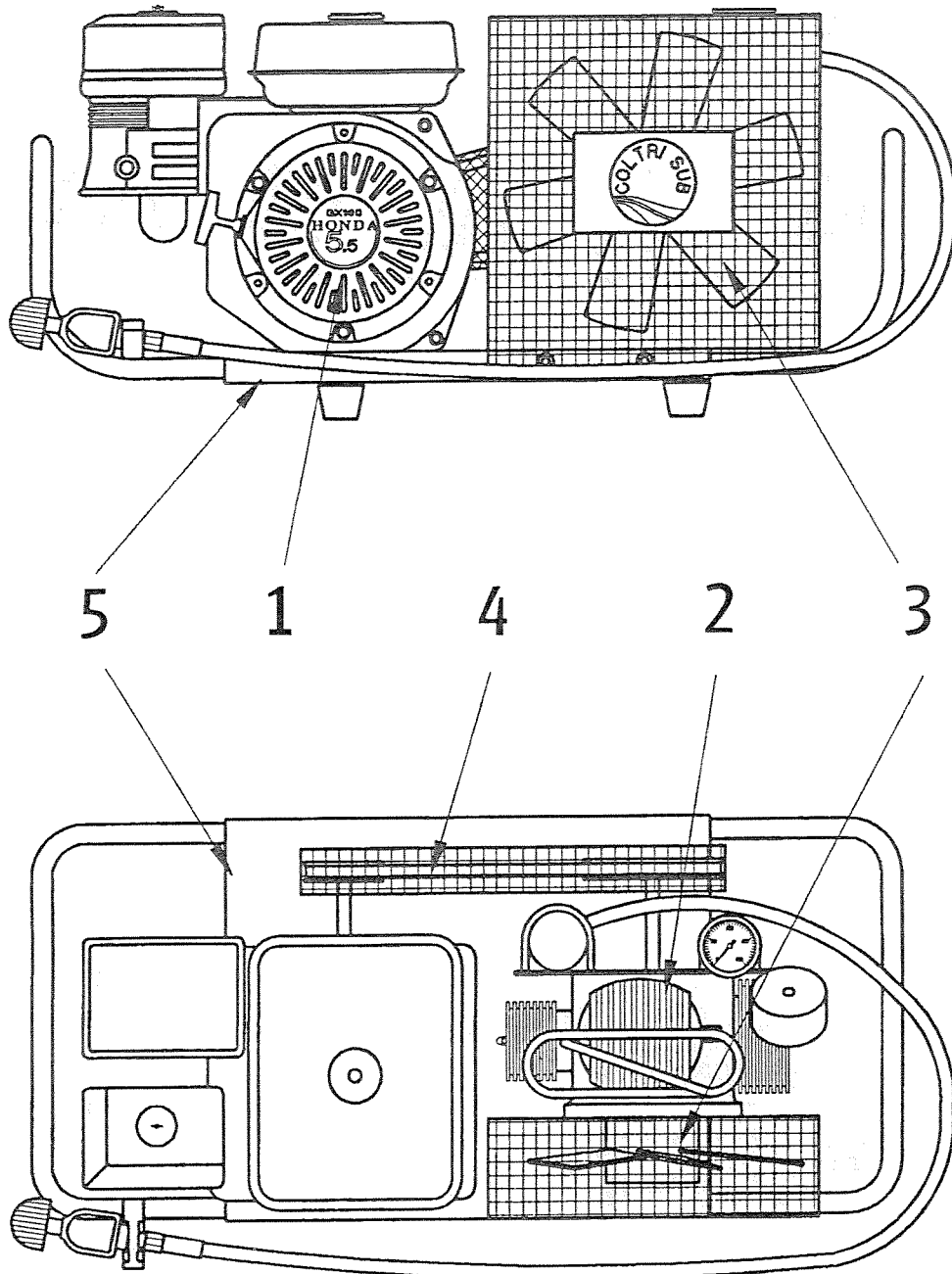


Fig. 04

### 3.4.1 Areas with Safety devices



The MCH6 compressor is covered with a series of fixed protection device that guarantee the operator's safety, limiting the operation area and ensuring its performance. Figure 06 shows the safety devices on MCH6.

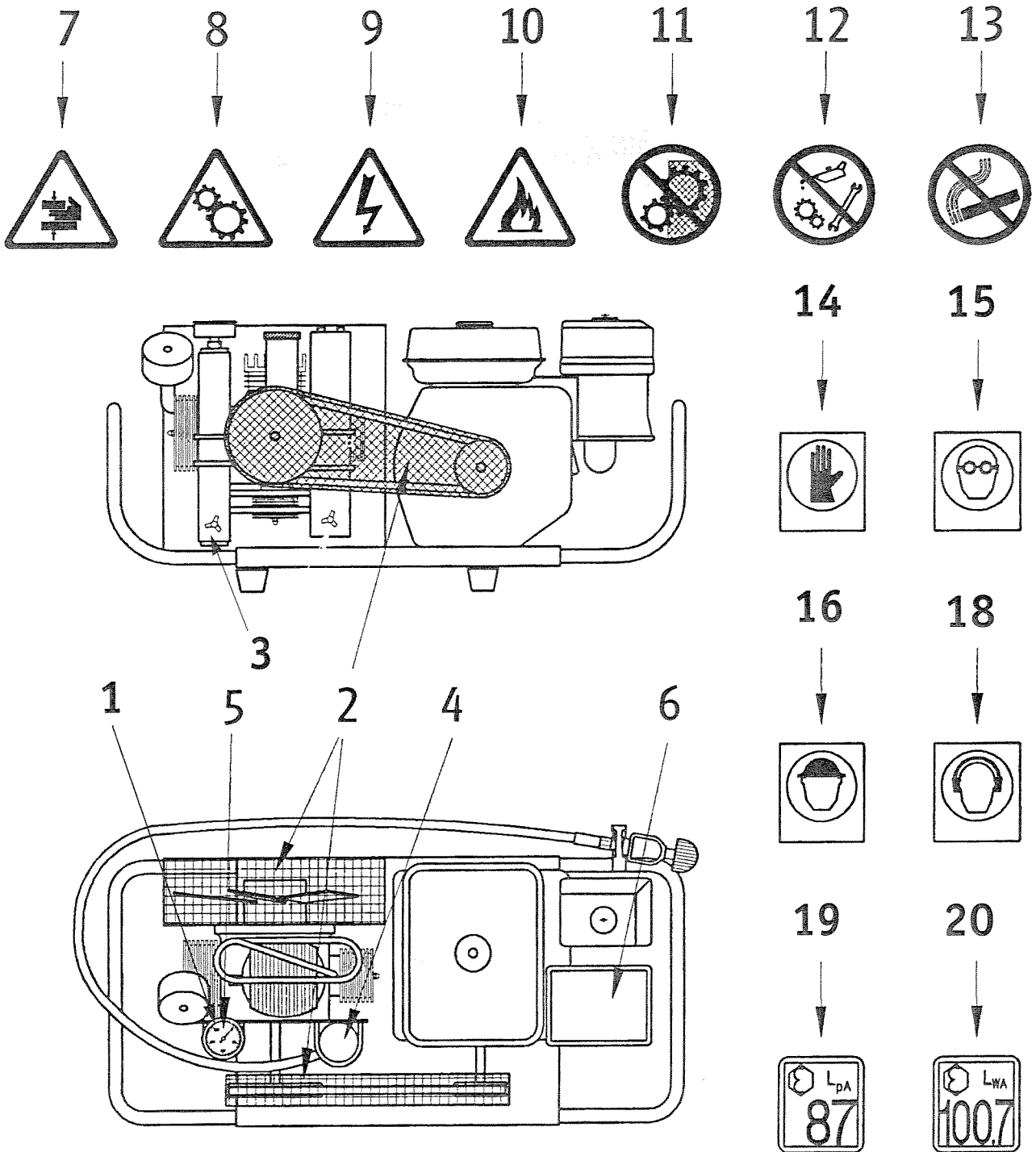


Fig.06a

N°	Safety Device	Description	Check the following
1	Safety Valves	Protects the fourth stage and tanks from excessive overfilling. It is set at the factory.	The safety valve must be checked with every fill. Start the compressor with tank valve closed and fill valve open. Once the valve performance has been checked, open all the valves and start the fill process.
2	Shroud	Built in welded steel net. It protects the cooling fan and the drive belt	Check periodically if the shroud is complete
3	Condensate Drain	The condensate is a white milky emulsion, formed by oil and water. As the filter absorbs water, it saturates and consequently, gets contaminated.	Open drain valves every 10-15 minutes. Make sure that the condensate is being drained in a consistent way.
4	Charcoal and Molecular Sieve Filter	Air quality depends on the Filter condition	Replace the cartridge before the air starts smelling. Check table on paragraph 6.8 about change periods.
5.	Pressure Gauge: It indicates the compressor's working pressure		
6.	Shield to protect muffler (combustion engines)		
7.	Sign: Hazard to hands (crushing)		
8.	Sign: Hazard. Gears in movement		
9.	Sign: Hazard. Electrical tension		
10.	Sign: High temperature and Fire hazard		
11.	Sign: "Do not remove safety devices"		
12.	Sign: "Do not operate while moving"		
13.	Sign: "Do not smoke"		
14.	Tag indicating it is mandatory to wear gloves		
15.	Tag indicating it is mandatory to wear eye protection		
16.	Tag indicating it is mandatory to wear a helmet		
17.	Tag on electric motor, indicating Amp, Volt, Cycle, Power, Phases		
18.	Tag indicating it is mandatory to wear hair cap		
19.	Tag indicating acoustic level (Model MCH6/SH only)		
20.	Tag indicating sonic power level (Model MCH6/SH)		



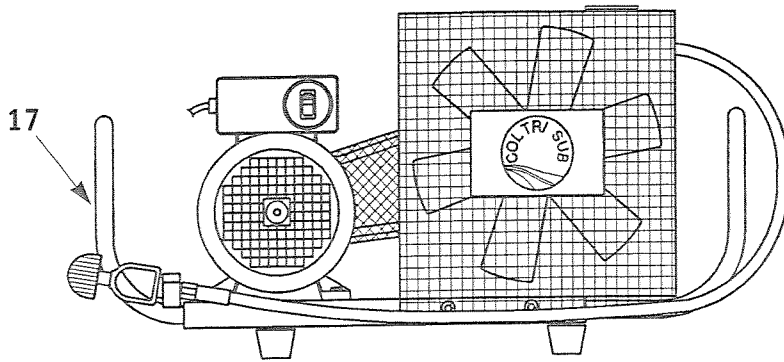
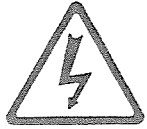
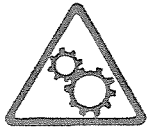
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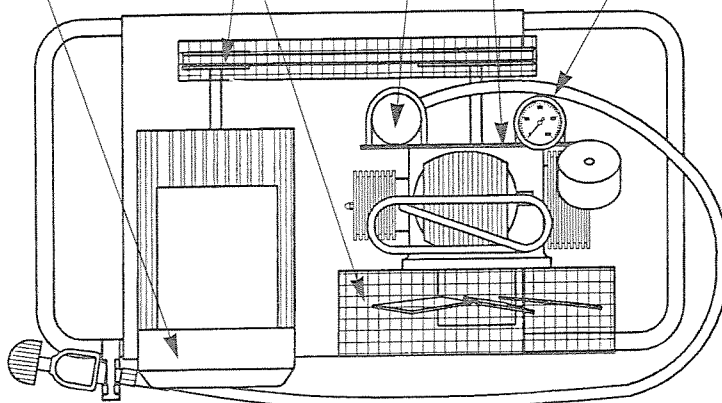


Fig. 06b



### 3.4.2 Areas of Residual Risk



There are some risks on or around the machine that cannot be eliminated or limited because of the particular feature of the MCH6 compressor. (See figure 06.b). Every operator must be familiar with the residual risks on this unit in order to prevent accidents.

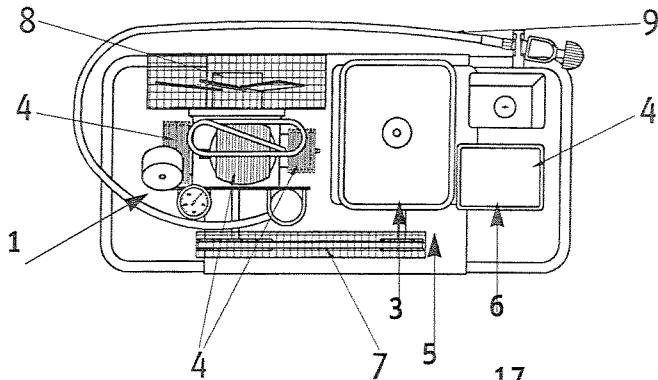


Fig. 06c Residual risks areas

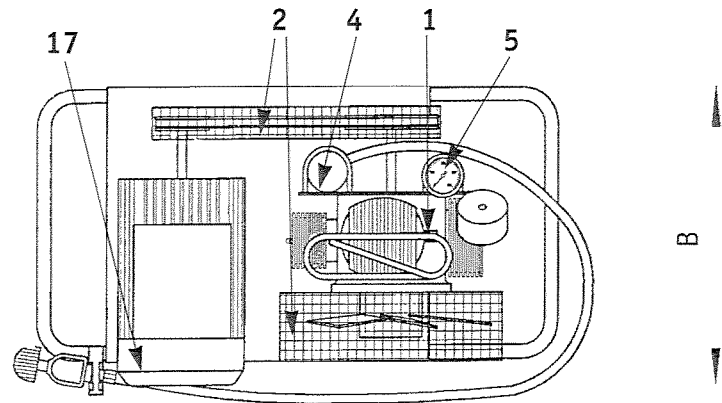


Fig. 06d

Pos.	Description
1.	Hazard of Contamination due to possibility of mixture of exhaust fumes or oil vapors with compressed air
2.	Hazard of an electrical nature. Operate the unit with proper electrical protection, especially if water or moisture are present.
3.	Hazard, derived from the use of a combustion engine. Operate according to the instruction manual for the engine enclosed.
4.	Thermal hazard, around the muffler and the compressor areas. Operate the unit with proper protection. Wait about 30 minutes after turning the engine off before attempting any maintenance procedures.
5.	Sound hazard, due to noise produced by the compressor.
6.	Fire Hazard
7.	Hazard of crushing on drive belt area.
8.	Hazard of abrasion and drag around cooling fan area.
9.	Hazard of direct contact with operator in case of fill whip breakage during the filling process.

### 3.5 Regulation References

Community Regulations 89/392/CEE, 91/368/CEE, 93/44/CEE, 93/68/CEE.

UNI-EN 292-1 Operator's Safety. Fundamental concepts, projecting general principles.  
Part 1: General Terms, Base methodology (September 1991)

UNI-EN 292-2 Operator's Safety. Fundamental concepts, projecting general principles.  
Part 2: Specifics and Technical Principles. (September 1992)

CEI-EN 60204-1 Operator's Safety. Electrical Outfit of Compressors.  
Part 1: General Rules (October 1992).

## 4 INSTALLATION

Personnel interested in installing the compressors must be qualified and have a proper technical training and background so that they can perform the different operations with an adequate competence.

### 4.1 Transportation

**It is very important to be very careful when lifting, transporting and locating the unit.**

The MCH6 compressor is shipped completely assembled and packed in cardboard boxes to have it transported in a safe way.

Use an appropriate system that allows to move a weight bigger than the one of the unit.

The unit's weight is shown on Chapter 2-TECHNICAL DATA.

To lift the unit, after taking it out of the box, use the handles M on the sides of the compressor as indicated on figure 07: It is not possible for one person to lift the compressor by himself; it is necessary to have two people to lift it.

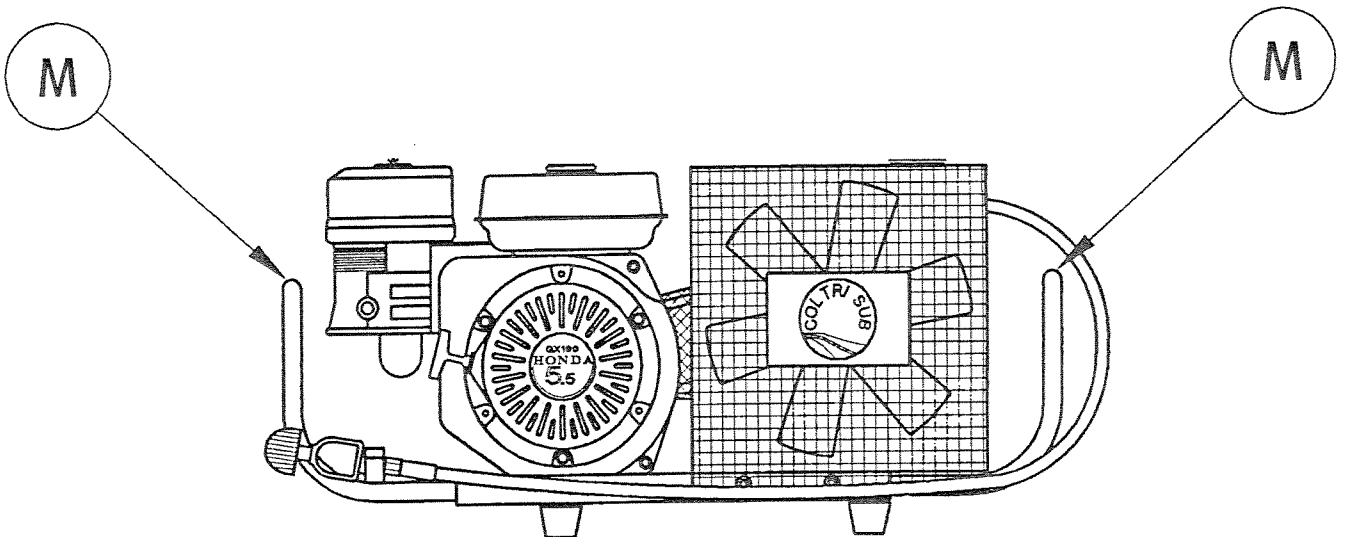


Fig. 07 Compressor lifting

## 4.2 Compressor positioning

Personnel interested in positioning operations for the compressors, must have read accurately this instruction manual and keep in mind all the warnings in it.

Ventilation is very important: to insure good cooling of the system, the place where the compressor is must be well ventilated, with a proper air circulation.

Position the compressor on a flat plane, with a maximum inclination of 5 degrees. This way, lubrication of the unit is adequate. Make sure that the intake is located away from any source of polluted air. To accomplish this, use the sectioned pipe and attach it to the compressor filter as follows:

1. Completely unscrew the filter from the unit.
2. Screw the male 1/2" fitting to it. Then, attach tube No. 2 (flexible, extended tube), which is 20 mm internal diameter. Mount the filter back in place. (paragraph 6.6)
3. Locate the unit in a well ventilated area, away from atmospheric phenomena and make sure what the wind direction is, in order to position the intake filter adequately. See figure 08.
4. Make sure the intake tube is not bent or broken.

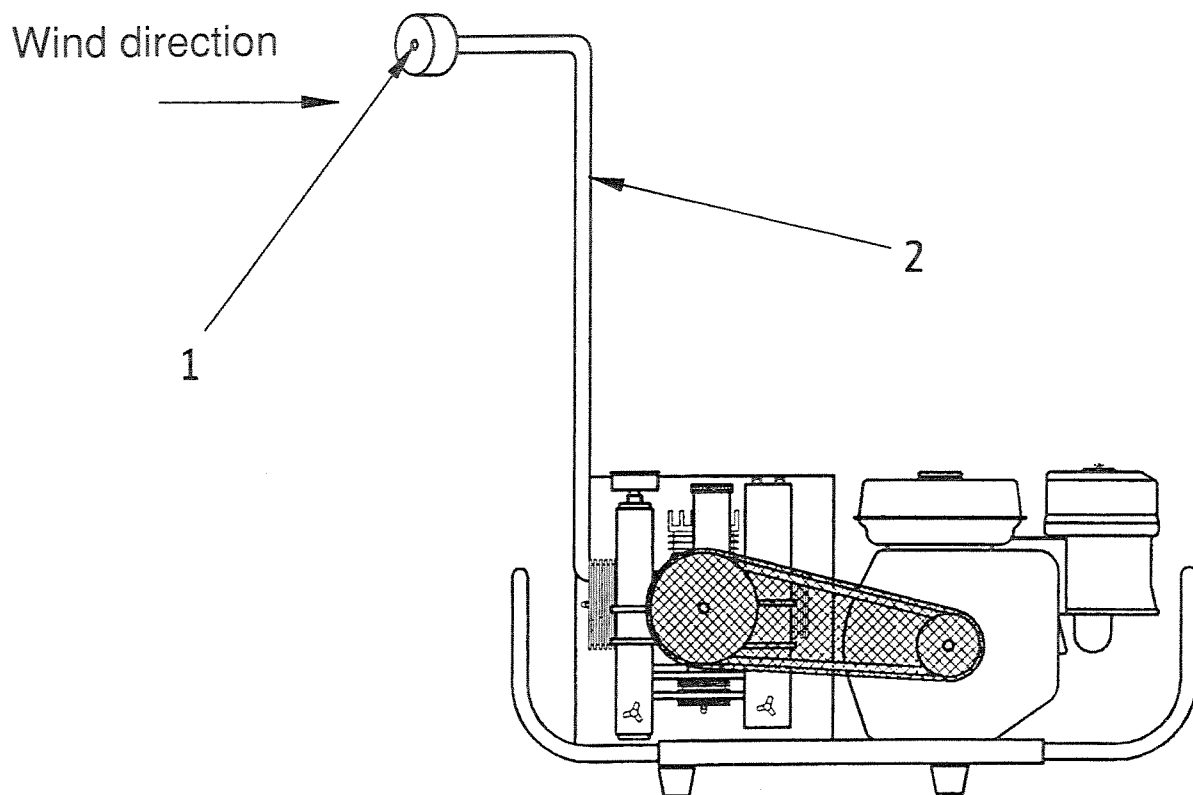


Fig. 08 Remote positioning of the intake filter

### 4.3 Electrical connections (only for MCH6/EM and MCH6/ET)



Make sure that the electrical install is in accordance with the safety regulations, specially CEI 64-8 (IEC 364). The electrical install must be adequate to support the maximum pull for the unit and the same as the reported value on the electric panel. The electric cable must of the appropriate gauge to stand the installed power.

Check to make sure that the feed lines are compatible with the ones for the machine.  
Check values on the electric panel.

When making the electric connections, it is a good idea to keep in mind the general rules for installation and preparation of electric hook-ups. See Rule **CEI 64-8 (IEC 364)**.

**The unit is assembled with a hook CEE 16A either single or three phase. For incoming electrical tension, please check the data on the electric motor plate.**

**Make sure that the cooling fan is rotating in the right direction. It is depicted on the fan shroud. To change the fan's sense of rotation, on a three phase motor, simply switch two of the three legs and hook them up to the incoming power line. This must be done after isolating the unit, unplugging the unit from the incoming power. Incoming section means the electric cord the unit comes with.**

Be extremely cautious about grounding the unit. It must be in accordance with rule CEI 64-8 (IEC 364).

**The grounding of the unit is the customer's responsibility.**

The compressor's electric diagram is shown in the appendix.

#### **CAUTION**

**DO NOT USE GASOLINE, DIESEL OR ELECTRICALLY OPERATED COMPRESSORS ON BOARD OF VESSELS. AEROTECNICA COLTRI CAN DELIVER UNITS FOR SUCH USE, APPROVED BY R.I.NA (ITALIAN NAVAL REGISTRY).**

## 5 OPERATING INSTRUCTIONS

When starting the compressor, be very careful about residual hazards mentioned on paragraph 3.4.2. The following list describes them:



### CAUTION

Be extremely careful about the possibility of mixture of compressed air with combustion gases or oil vapor in the intake.



### CAUTION

Electrical hazard. Operate the unit with proper electric protection, especially if there is moisture of water.



### CAUTION

Follow the instruction manual to operate the combustion engine. Improper use of combustion engine may result in a hazardous situation. Make sure to read the attached engine manual prior to start the unit.



### CAUTION


The exhaust area is a hot area. Use proper protection while operating the unit, since there is danger of body damage (burning). Wait about 30 minutes after stopping the unit to perform any maintenance on it.




### CAUTION

REPLACE THE FILL WHIP PERIODICALLY (ONCE A YEAR) OR EARLIER. IF IT SHOWS SIGNS OF WEAR. IGNORING THIS RULE MAY RESULT IN GRAVE DAMAGE TO THE OPERATOR. IT IS IMPORTANT TO KEEP THE WHIP MINIMUM RADIUS OVER 10 INCHES.

## IMPORTANT

 In the event of any electric problem, stop the unit using the switch identified with O-I, unplug the compressor from the incoming power and get assistance from the appropriate personnel. For combustion operated units, stop the compressor using the kill switch, turn it to the Off (O) position. (See attached manual).

## IMPORTANT

 Do not climb on the compressor.

Personnel assigned to unit maintenance must limit themselves to the tasks identified on paragraph 3.4 and limit their own movement around the machine to the area identified with an X in figure 03. Any person assigned to work or operate the machine must have read and understood this manual previously, especially Warnings.

## 5.1 The compression process

The air surrounding the compressor must be free of toxic substances. Air enters the compressor through the intake filter. It goes to the First stage Intake valve, and the first stage of compression starts.

The air flow produced by the cooling fan dissipates some of the heat produced during the compression period on the head, block, valves, pistons, cylinders and lubricating oil. The rest of the heat is dissipated in the cooling tubes that connect the different compression stages. The compressed air's temperature is only a few degrees hotter than the ambient temperature. The working temperatures for each stage are as follows: Intake cylinder: 60 to 68 degrees F over ambient temperature (it must be cool on touch). At the discharge valve, about 176 to 232 degrees F.

The intake air has a certain percentage of moisture, varying according to atmospheric conditions. During the compression process and following cooling, moisture condenses and forms, along with small oil particles, a white milk-like emulsion that precipitates in the separator.

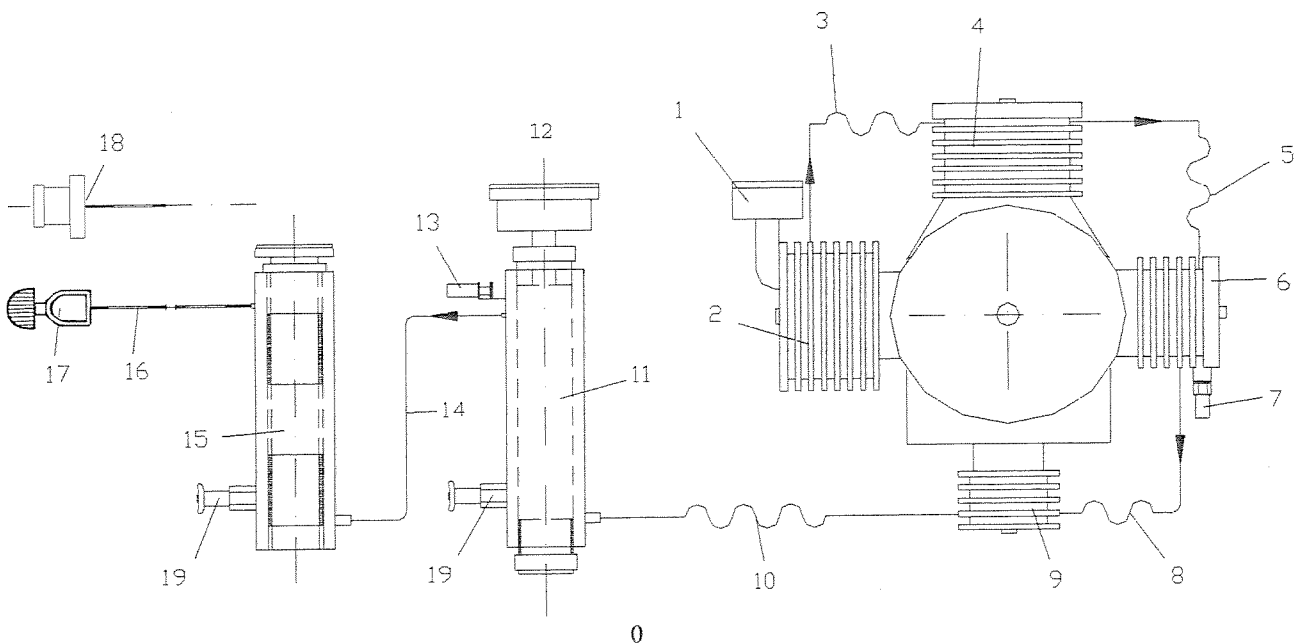


Fig. 09. Compression Diagram

1 Intake Filter	11 Condensate separator
2 First stage	12 Pressure Gauge
3 Cooling Tube 1 <sup>st</sup> -2 <sup>nd</sup> stage	13 Final Safety Valve (3300/4800 psi)
4 Second stage	14 Cooling tube cond. sep.-Filter
5 Cooling Tube 2 <sup>nd</sup> -3 <sup>rd</sup> stage	15 Molecular Sieve and Activated Charcoal Filter
6 Third stage	16 Fill Assembly
7 Safety Valve 3 <sup>rd</sup> stage	17 Yoke and Knob
8 Cooling Tube 3 <sup>rd</sup> -4 <sup>th</sup> stage	18 DIN Adapter (available upon request)
9 Fourth stage	19 Condensate valve
10 Cooling Tube 4 <sup>th</sup> stage cond. separator	



## 5.2 COMPRESSOR DESCRIPTION

### 5.2.1 Crankcase, Pistons, Cylinders, Crankshaft

The crankcase is made of aluminum alloy. The flanges (crankcase covers) have ball bearings that support the crankshaft and are sealed by means of O-Rings. The crankshaft and connecting rods rotate exclusively on pin or ball bearings. All the rods are mounted on the crankshaft with a unique angle.

The first and second stage pistons are made of aluminum and have traditional piston rings. The third stage piston is made of a special steel with three teflon piston rings. The fourth stage piston is made of tempered steel stabilized without elastic rings, coupled with its sleeve following an individual matching process.

### 5.2.2 Valves

The first stage valves are screwed in place, in their places, that have been threaded into the head itself.

The second, third and fourth stage valves lay under the heads and can be removed by simply removing the heads.

### 5.2.3 Safety valves

Safety valves are pre-set upon compressor assembly and their function is to avoid an over-pressurization in the event of a malfunction. The pressure at which the valve is set off is either 3300 psi or 4400 psi.

**Do not tamper with safety valves. Doing so may result in serious damage to the unit and cancels the warranty.**

### 5.2.4 Cooling tubes, lubrication

The cooling tubes are made of stainless steel.

The compressor is splash lubricated. There's a scoop on the lower end of the second stage connecting rod that picks up the oil and splashes it.

### 5.2.5 Frame, shroud

The compressor is mounted on a welded steel frame that is then painted with epoxy and is prepared for the different motors. The cooling fan and drive belt are protected by a steel shroud with a welded steel mesh.

## 5.4 TANK FILLING PROCEDURE



### CAUTION

PERSONNEL NOT ASSIGNED TO COMPRESSOR RELATED TASKS MUST STAND AWAY FROM THE COMPRESSOR, AT LEAST 10 FEET.



### CAUTION

FILL ONLY TANKS HYDROSTATICALLY TESTED AND CURRENT WITH IT. DO NOT FILL BEYOND THE WORKING PRESSURE, STAMPED ON TANK SHOULDER.



### CAUTION

OPERATE ONLY WITH CLEAN, NON POLLUTED AIR; DO NOT USE THE COMPRESSOR IN DUST-FILLED AREAS OR WHERE THERE IS CORROSION, FIRE OR EXPLOSION HAZARD.



### CAUTION

MAKE SURE TO HAVE THE AIR INTAKE AWAY FROM COMBUSTION ENGINES EXHAUST FUMES.



### CAUTION

DO NOT USE THE COMPRESSOR TO COMPRESS GASES DIFFERENT THAN AIR. FAILURE TO DO SO CAN CAUSE SEVERE DAMAGE TO OPERATOR.

 **IMPORTANT**

IT IS ADVISABLE TO IMMERSE TANKS IN COLD WATER DURING THE FILLING PROCEDURE IN ORDER TO AVOID PRESSURE REDUCTION UPON TANK COOLING.

 **IMPORTANT**

IT IS IMPORTANT TO KEEP IN MIND THE RESIDUAL DANGERS LISTED IN PARAGRAPH 3.4

 **IMPORTANT**

CHECK THE ACCURACY OF THE SAFETY VALVE, CLOSING THE FINAL VALVES, CAUSING THE PRESSURE TO RAISE IN THE SYSTEM AND ACTIVATING THE SAFETY VALVE.

 **IMPORTANT**

DURING THE FILLING PROCESS, BLEED THE DRAIN VALVES EVERY 15-20 MINUTES TO DRAIN THE CONDENSATE FROM THE SEPARATORS (SEE FIGURE 05, No. 15). THE EMULSION FORMED BY OIL-WATER IS NORMAL. THE AMOUNT OF CONDENSATE WILL VARY ACCORDING TO ATMOSPHERIC WATER CONTENTS. LEAVE THE CONDENSATE VALVE OPEN AND THE COMPRESSOR OPERATING BEFORE AND AFTER A TANK FILLING SESSION TO ELIMINATE EXCESS OF WATER.

 **IMPORTANT**

OPERATORS MUST BE VERY CAREFUL NOT TO GET HAIR OR PARTS OF THEIR CLOTHING TANGLED UP IN COMPRESSOR MOVING PARTS. IT IS RECCOMENDED TO WEAR HAIR CAPS OR NETS FOR LONG HAIR.

DO NOT WEAR CHAINS, BRACELETS OR RINGS WHEN OPERATING THE UNITS. COMPRESSOR OPERATORS MUST WEAR PROTECTIVE CLOTHING, SUCH AS APRONS, GLOVES, HELMETS, SAFETY GLASSES, SAFETY BOOTS AN EAR PROTECTION.

## TANK FILLING PROCEDURE:

- 1) Connect the fill yoke to tank valve.
- 2) Start the compressor. Make sure that the drain valve is open.
- 3) Wait about one minute before closing drain valve, to allow the residual condensate to warm up and drain out of the compressor.
- 4) Wait a couple of minutes before opening the tank valve, until the pressure shown on the pressure gauge is the same as in the tank.
- 5) Upon tank filling procedure, open drain valve, wait until pressure drops to zero in fill assembly and disconnect tank valve from fill valve. Wait a few seconds before stopping the compressor to allow condensate to drain out of the compressor.

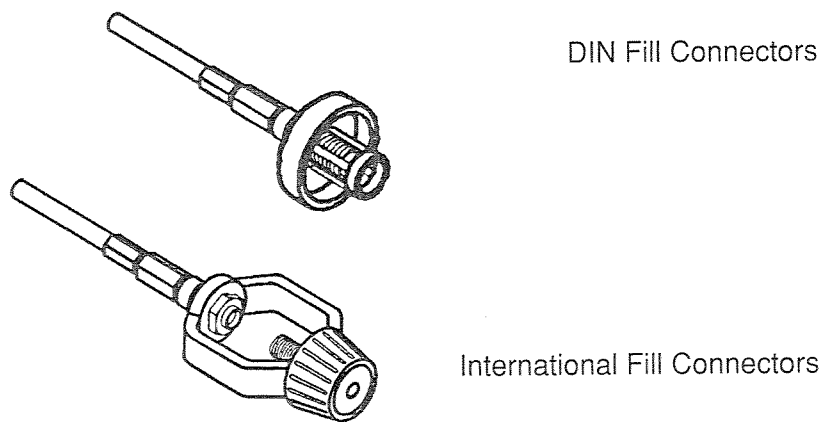


Fig. 11 Tank Fill Connections

## 5.5 MACHINE STOP

Please read the attached manual for combustion engine for model MCH6/SH

To stop the unit (models MCH6/EM and MCH6/ET), move the ON/OFF switch to the OFF position. Then drain the condensate by means of the drain valves on the base of the unit. Check the oil level and follow the indications given in chapter 6.

## 5.6 EMERGENCIES

The units have an emergency system that stops it automatically if:

- (1) There is a momentary interruption on power.
- (2) The electric motor's overload is activated. Besides, in the event of tank over-pressurization, the safety valve goes off and air is dumped off the compressor while the unit is still running.

### CAUTION

☞ After any emergency stops, make sure the source of the problem has been eliminated before attempting operating the unit again.

## 6 MAINTENANCE



### 6.1 General considerations





Before attempting any maintenance procedure, read the instruction manuals, for the compressor and combustion engine. Maintenance work should be performed only by personnel assigned to maintenance, therefore, trained and competent personnel. For any maintenance work, either regular or extraordinary, AEROTECNICA COLTRI can be of assistance. Failure to follow safety instructions can result in damage to the operator, the environment and/ or the unit itself.

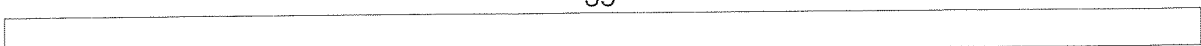


#### WARNING

**Make sure to stop the unit before any attempt to perform maintenance work on the compressor. Have the unit in a position such that it cannot be started without the operator's consent.**


This way, there is no chance of an accidental compressor start-up while the unit is being worked on.


-  Any maintenance procedure has to be performed with the unit in the off position, and unplugged from the outlet (electric version). Gasoline or diesel units have to be turned off.
-  Follow the maintenance procedures as indicated in the instruction manual.
-  Operators must be careful about the risk of clothing parts or hair entanglement on any of the moving parts of the unit. Be also very careful about rings, chains and bracelets.
-  Operators must wear protective devices, such as aprons, gloves, ear and eye protection, helmets, safety boots.




There are tags on the electric motor, warning about high tension hazard.  
Follow the scheduled maintenance procedures for the electric motor.

Do not replace compressor parts with any parts different than original Coltri parts.

 After completing any maintenance in the compressor, make sure that all the old parts have been removed from the unit, before attempting operating the compressor. Make sure to have all the safety devices properly hooked up and in working order. Make sure all the warning tags are on the compressor and are readable.

 When servicing the pump itself, be very careful not to let any strange objects to get in the unit, since it can cause malfunction or affect the safety devices on the unit.

 Avoid performing any maintenance procedures on the unit with bare hands.

There could be instances when the technician has to perform a check-up of the unit with the compressor operating.

In this specific case, instructions have to be imparted in order to ensure the following:



#### WARNING

The operator assigned to the unit and the person assigned to maintenance must be in one another's sight, in order for communication to be clear and easy.



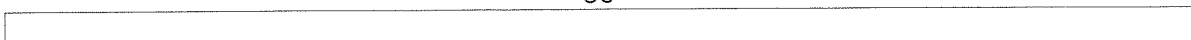
#### WARNING

The operator acts according to the technician's instructions.



#### WARNING

The maintenance service is performed in a well illuminated area.





### WARNING

Before starting any part of the unit, the technician must be in a safe position, and when getting close to any moving parts, he has to make sure that his instructions are being followed by the operator.



### WARNING

Do not perform any cutting or welding of tubes or containers that hold or have ever held any flammable liquids.  
In case of doubt, do not perform the operation, wash with a non flammable solvent (wear protective mask). Do not perform cutting or welding procedures in places that present any hazard of ignition.



### WARNING

Refer to the attached manual for the combustion engine when performing any service, lubrication or general maintenance. Use only parts supplied by AEROTECNICA COLTRI to ensure good quality parts.  
Some replacement parts are safety parts. Therefore, use only original parts.



### CAUTION

ALL THE MAINTENANCE AND/ OR SERVICE OPERATIONS MUST BE PERFORMED ACCORDING TO THE INSTRUCTIONS AS INDICATED IN THE MANUAL.  
THE TECHNICIAN MUST HAVE A LOGBOOK RECORDING EVERY SERVICE WORK PERFORMED ON THE COMPRESSOR.  
DO NOT PERFORM ANY MAINTENANCE WORK ON THE COMPRESSOR UNLESS IT IS OFF AND DEPRESSURIZED.

## SCHEDULED MAINTENANCE TABLE

Hours	Description
1/5	Check the heads: the intake side of the head must be cool and the compression side must be very hot.
5	Change oil (See paragraph 6.3)
25	Service the intake filter (See paragraph 6.6)
30	Check drive belt tension (See paragraph 6.5)
50	Check tightness of cooling fan and shroud screws. Change filter cartridge (See paragraph 6.8) Change oil in compressor (See paragraph 6.3)
100	Service intake and discharge valves. Replace valve springs. Change intake filter.
yearly	Replace fill assembly (See 6.9)

### 6.2 Troubleshooting

Problem	Cause	Solution
Electric motor does not start	Missing phase	Check condenser and fuses
Rotation speed and capacity flow diminished	Motor power is insufficient	Check line and motor
	Slipping drive belt	Re-tighten drive belt
Air output is reduce without reduction on rpm	Inoperative Valves	Contact technical assistance
	Worn Fourth Stage Piston	Contact technical assistance
	Intake Filter plugged	Replace Filter
	Intake Hose bent	Straighten hose, use semi-rigid intake hose
Oily smell in air	Piston or piston rings worn	
	Filter cartridge saturated	Replace filter cartridge
Compressor running too hot	Piston or piston rings worn	Contact technical assistance
	Wrong sense of rotation	Check rotation
	Dirty cooling tubes	Contact technical assistance
	Valves are not closing completely (causing overload of another stage)	Contact technical assistance



### 6.3. Oil checking and exchanging

Check oil level every day, before starting the compressor. Oil level must be between the maximum and minimum marks on oil dipstick. See No. 1, figure 12.

Oil level too low prevents good lubrication of compressor and will cause piston seizing. Change oil after the first 50 hours as a break-in practice. Then change oil every 50 hours or every year, whatever comes first. Do not mix two different types of oil.

Procedure:

- 1) Unscrew cap No. 2
- 2) Tilt compressor a few degrees to allow oil removal
- 3) Screw cap back, pour oil in compressor through hole No. 3. Use approx. 11 ounces of oil.
- 4) Check oil level. Make sure that the oil level is such that is shown between the two marks in the oil dipstick.

#### IMPORTANT:

DISPOSE OF USED OIL ACCORDING TO LOCAL REGULATIONS. (SEE CHAPTER 7)

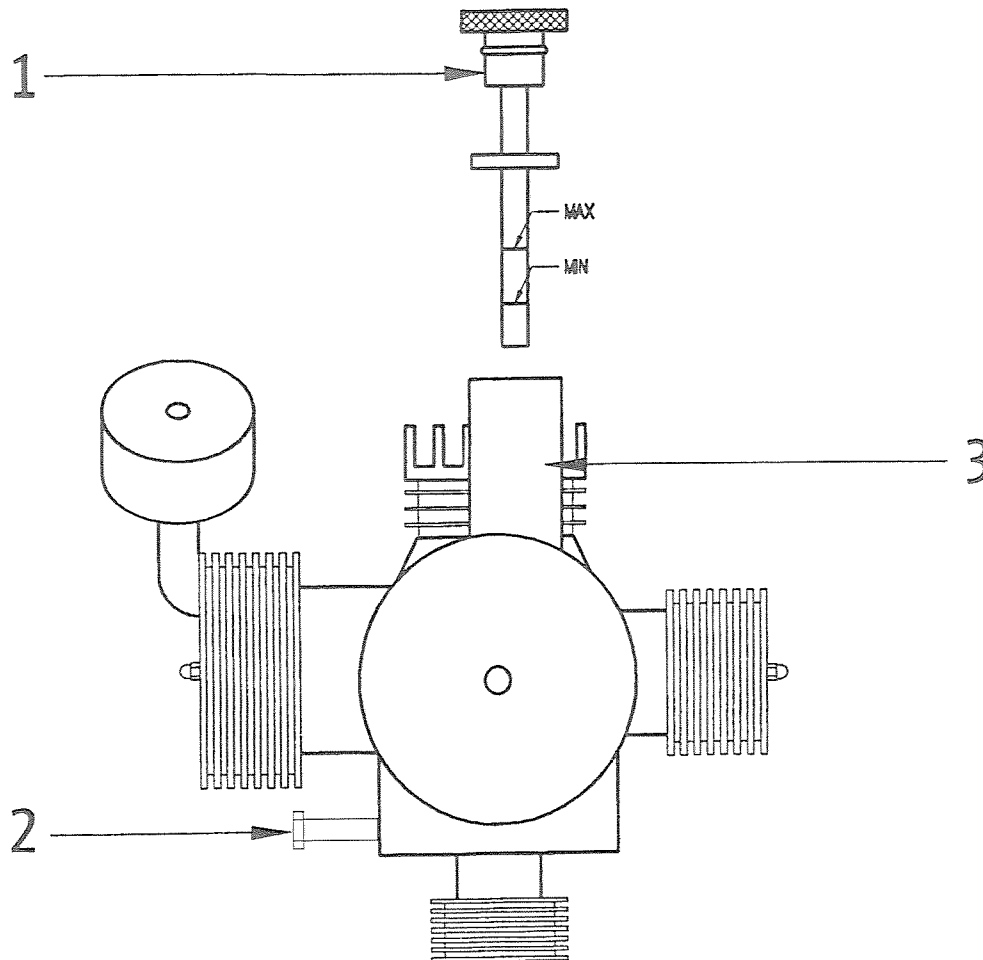


Fig. 12 Oil dipstick, showing max. and min. marks

#### 6.4. Safety valve check-up

The safety valve protects the final stage and tanks from an excessive over-pressurization. It is set at the factory.

The safety valve must be checked with every tank fill. Connect filler valve to tank valve. Start the compressor with closed tank valve.

Make sure the valve is being set at the right pressure. Use pressure gauge to ensure correct operation. Open tank valve and start tank fill. In the event of noticing the safety valve not operating at set pressure, contact Coltri's technical service.

#### 6.5. Drive belt tension

Make sure there is enough room between pulleys and shroud to avoid contact with the drive belt during compressor operation due to stretching after 30 hours. The belt flex should not be more than 1/4" when applying a force of 10 to the mid section of the belt, as shown in figure 13.

The procedure to verify the belt tension is as follows:

- 1) Remove shroud by loosening the retaining screws.
- 2) Check belt tension as shown in figure 13.
- 3) If the belt flex is more than 1/4", loosen the retaining screws (No. 2).
- 4) Apply a force bigger than 10 lb on the motor to maintain the tension and tighten screws No. 2
- 5) Re-check belt tension as instructed in 2).
- 6) Re-install shroud.

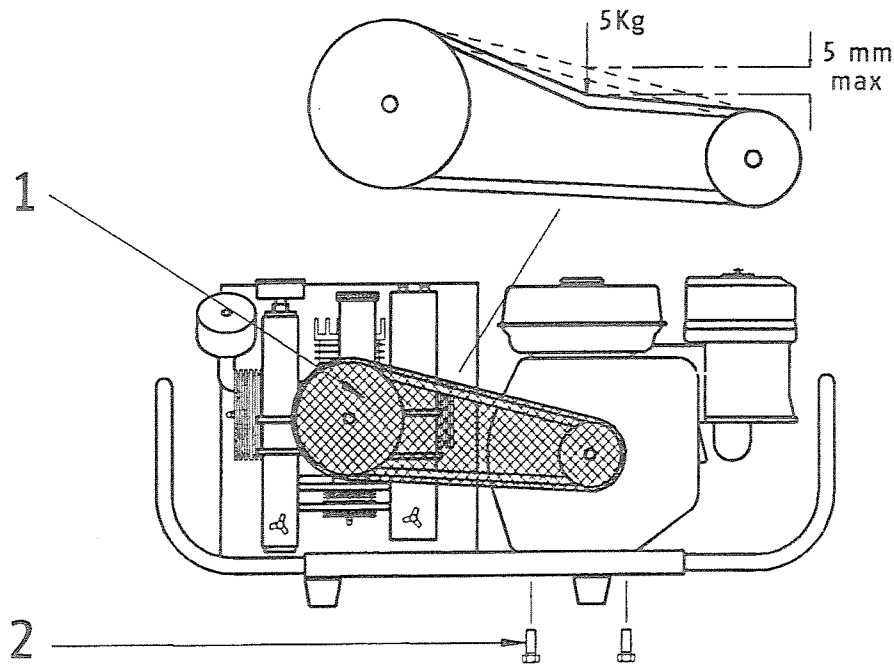


Fig. 13 Belt tension adjustment.

## 6.6. Intake filter

Check the intake filter every 25 hours of operation. To clean the filter element, blow air from the inside. Replace it every 100 hours of operation as follows:

- 1) Press slightly on cap No. 1 (figure 14) and rotate it clockwise.
- 2) Remove filter element (No. 2) from filter housing and replace with new filter element.

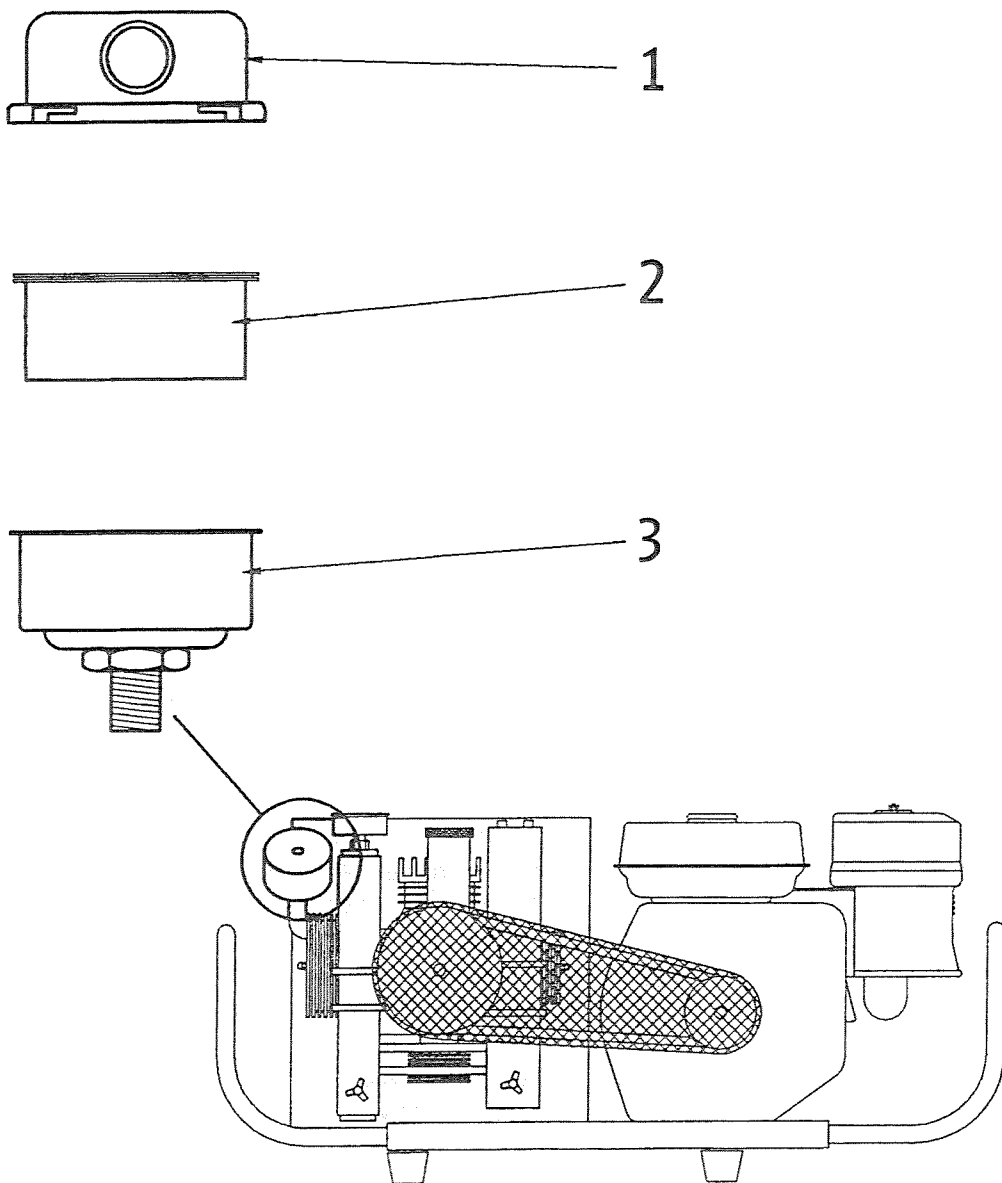


Fig. 14 Replacement of Intake filter element

## 6.7. Condensate discharge

Condensate = Water + Oil = Emulsion

This emulsion is white with a milky consistence. Some brown traces are also acceptable. In the event of getting a dense dark brown emulsion, proceed to service the compressor immediately.

Drain the condensate every 10-15 minutes.

## 6.8. Filter change intervals

Replace the filter cartridge before getting bad air.

Air quality depends mainly on cartridge condition. Therefore, it is very important to stick to the suggested intervals.

Replacement intervals are calculated taking into consideration compressor use and intake air temperature at 68 degrees F. If temperature is different, use the following table to calculate the filter coefficients:

Temperature (degrees C)	Temperature (degrees F)	Coefficient
50	122	0,20
40	104	0,34
30	86	0,57
20	68	1
10	50	1,85
5	41	2,60
0	32	3,80

MODELLO	Number of 72 cu ft. tanks to be filled		Volume of filtered air <b>m3</b>	Filter maximum <b>hours</b>
	<b>3000 psi</b>	<b>4400 psi</b>		
MCH 6	150	100	300	50



### **IMPORTANT**

**A DAMAGED ACTIVATED CHARCOAL FILTER CARTRIDGE CANNOT BE DUMPED DIRECTLY INTO URBAN DUMPSTERS.**

Service the filter only if the chamber is depressurized and the compressor is off.

Make sure the O-rings are OK. Replace if necessary. (See figure 15, No. 3).

Leave the filter cartridge inside of the filter chamber while the compressor is not in use.

Maintain a pressure of 600-1000 psi inside the filter to prevent moisture from getting in the filter housing.

To replace filter cartridge, do as follows:

- 1) Unscrew cap No. 1 in figure 15, using a screwdriver or a lever between the two studs on the cap.
- 2) Remove the cartridge (No. 2). Replace it with a new cartridge.
- 3) Check the O-rings on the Filter Cap (See figure 15, No. 3).
- 4) Screw the cap back in place.

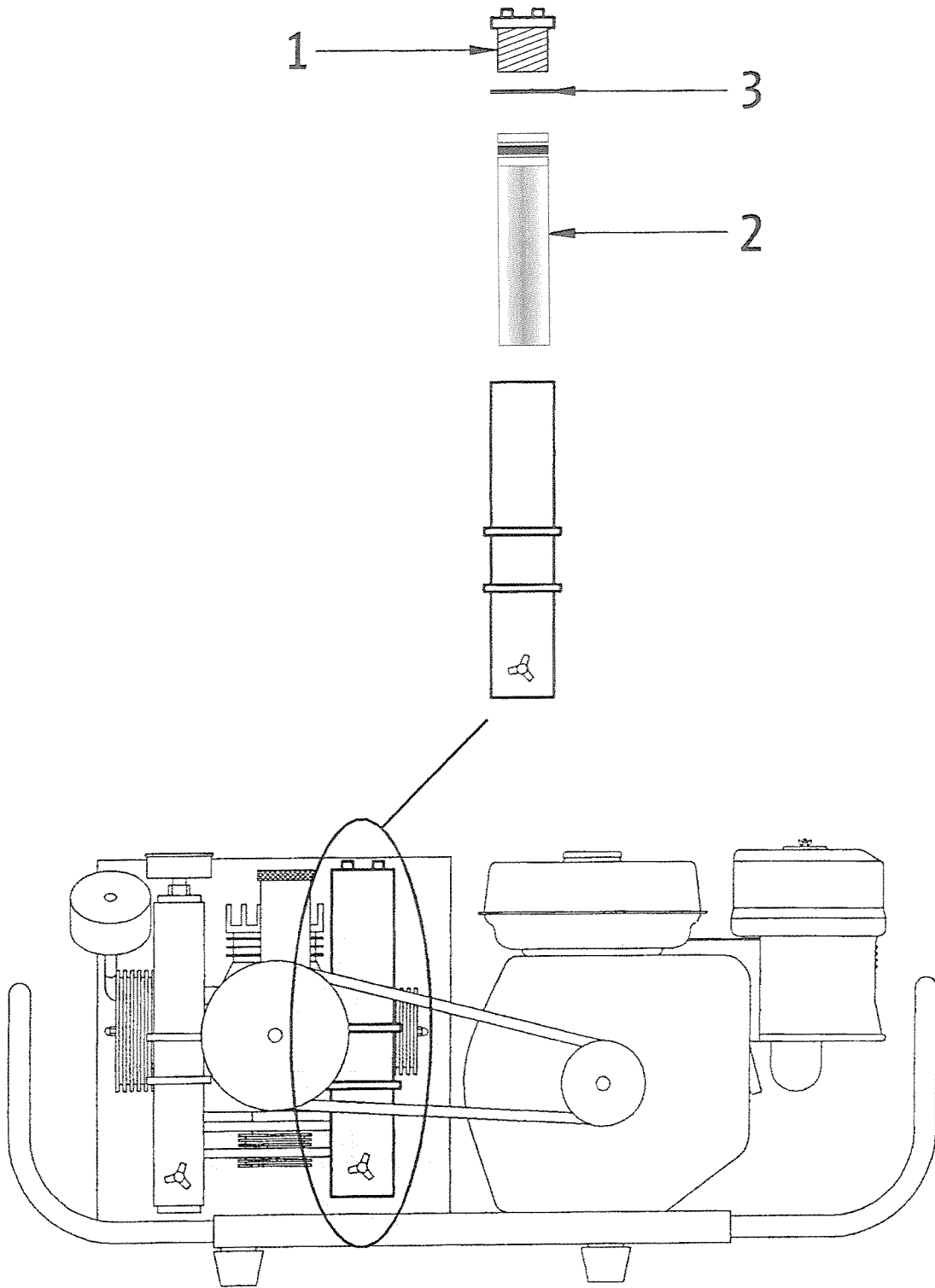


Fig. 15 Replacement of Filter Cartridge

## 6.9. Replacement of fill assembly



### CAUTION

THE FILL ASSEMBLY MUST BE REPLACED ONCE A YEAR OR BEFORE IF IT SHOWS SIGNS OF DAMAGE. FAILURE TO DO SO MAY RESULT IN A DANGEROUS SITUATION FOR THE OPERATOR.

THE MINIMUM CURVE RADIUS OF THE HOSE MUST BE BIGGER THAN 10 INCHES.

Replace the fill hose as follows:

- 1) Unscrew hose (No. 1) from fitting (No. 2)
- 2) Replace worn hose with new hose. Screw it to fitting No. 2
- 3) Check for air leaks using soapy water or Snoop.

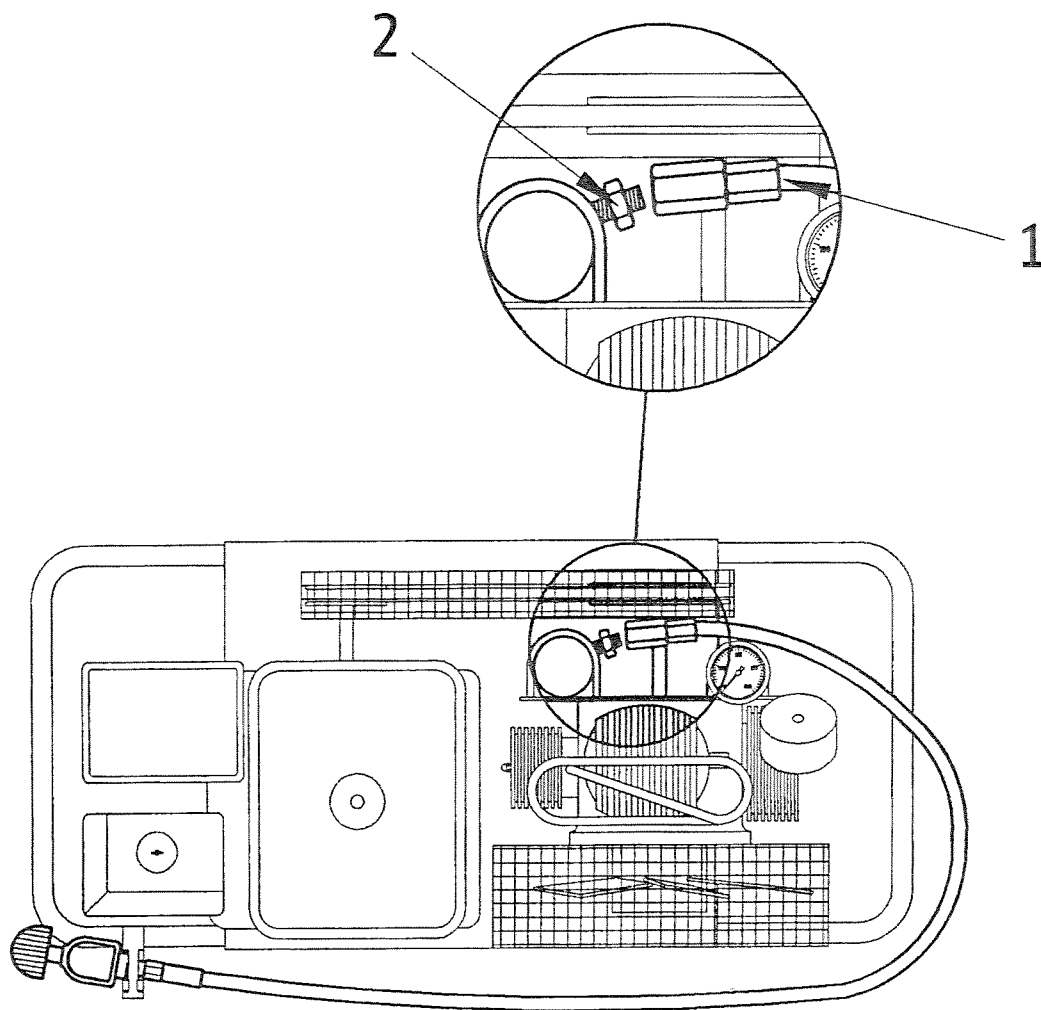


Fig. 16 Replacement of Fill Assembly

## 6.10 Intake and discharge valves

Valves can be disassembled for maintenance. The valve seats can be polished carefully by means of non flammable liquids, soft brushes (bronze or nylon). Avoid using steel brushes or screwdrivers. Valve service must be performed every 100 working hours. Replace valves if necessary.

## 6.11 Cleaning of the unit


Proper cleaning of the unit prevents formation of residues that may damage electrical or mechanical components. Clean the unit at least once a month.

## 6.12 Restart of compressor

If you are planning to stop the unit for long periods of time, remove filter cartridge from filter housing. Operate the compressor with open valves to ensure complete drainage of all condensate. Stop the compressor, remove intake filter, re-start the compressor and spray some drops of oil in the intake orifice, in order to coat compressor internal parts with a subtle layer of lubricant. Stop the compressor. Re-install intake filter. Clean outside of compressor, making sure to eliminate dust and any salt and/or oil deposits. Store the compressor in a clean and dry area, away from moisture or dirty environments.

## 6.13 Safety devices check-up

Safety devices have to be checked at least once a month and every time the unit is serviced. See paragraph 3.4.1 for safety devices list. Make sure they are all in working order and on the machine.

 Check the effectiveness of safety devices by interrupting the incoming power for a short period of time. This should cause the machine to enter the "Emergency Mode".

After an emergency situation, the compressor should not be easily started unless the cause for it to stop has been eliminated.

Check on the engine attached manual about emergency situations and procedures.

## 7 DISPOSAL OF WASTE

Use of the MCH6 compressor produces Special Waste products. Special Waste products are the result derived from industrial, agricultural, commercial use, etc., that are not easily assimilated by urban waste. Worn and/or obsolete machines are also special waste.

Worn activated charcoal is also considered special waste. Follow the special regulations according to the country where the compressor is being used.

It is mandatory to register the loading and unloading of used oils, special and/or toxic-harmful waste. Oil and special waste disposal must be performed by the appropriate agencies.

This is specially true for waste oils.

## 8 COMPRESSOR DISPOSAL

The compressor is a source of income. Therefore, to dispose of it you must follow the procedures applied in the country where the compressor is being used.

Unplug the compressor from the electric source.

Eliminate interaction of compressor with other machines. Make sure the other machines are not left inoperative.

Empty the gas and oil tanks, dispose it according to local regulations.

Disassemble the unit, grouping the components according to their composition. The compressor is made of steel, stainless steel, cast iron, aluminum and plastic materials.

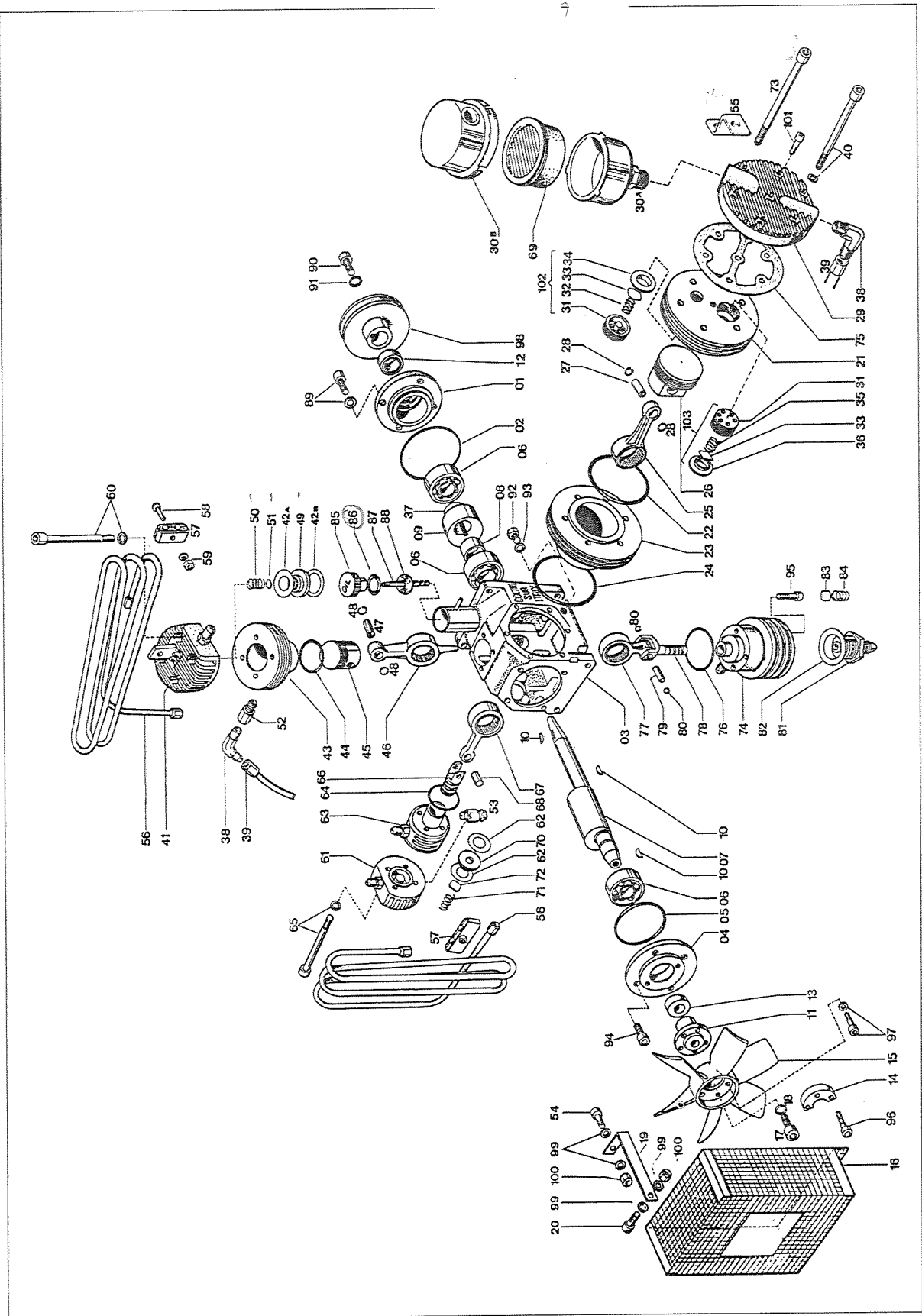
Proceed to dispose of these components according to local regulations.





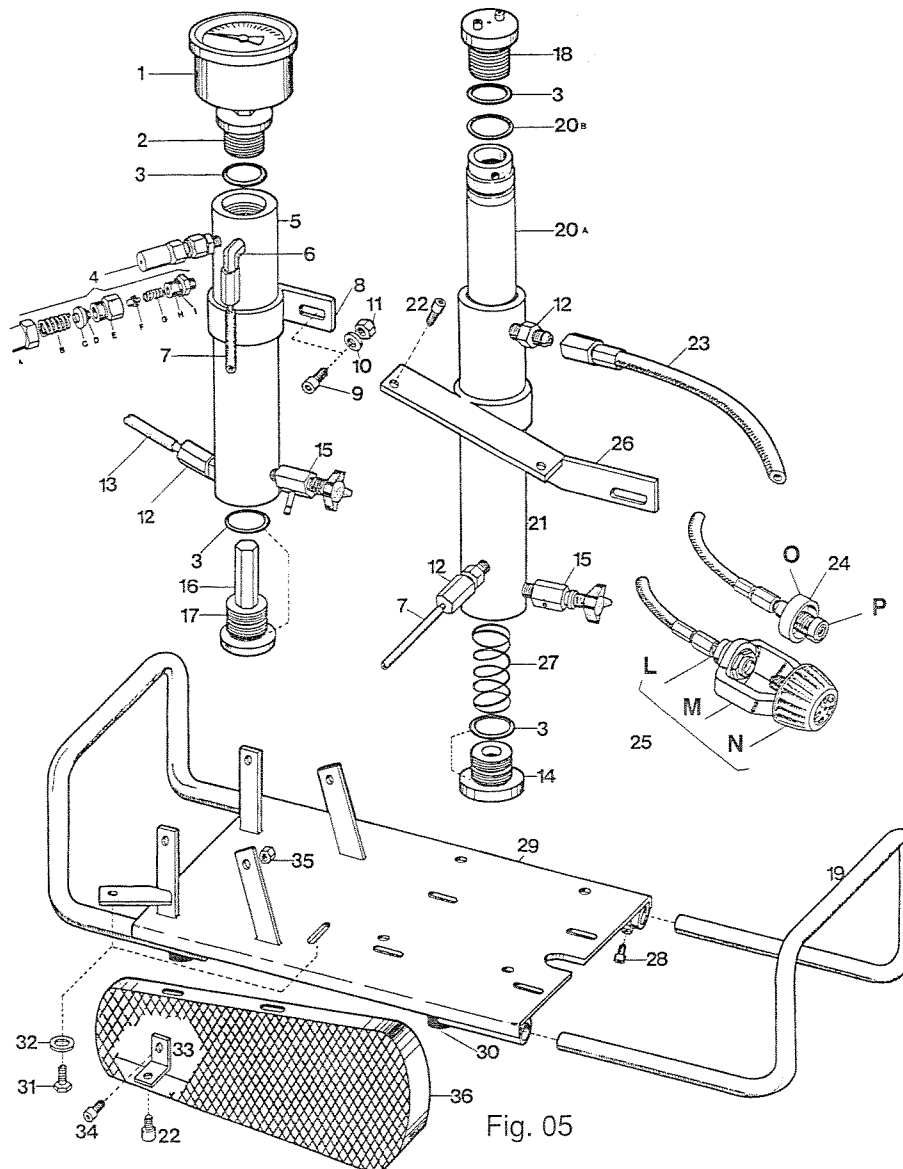
## 9 TABLE OF THE COMPONENTS OF THE PUMPING GROUP

N°	Part Number	Description	N°	Part Number	Description
1	6-00-008	Crankcase Cover (Small)	54	VITE0620	Screw T.C.E. zinc. 6x20 DIN912
2	OR-2250	O Ring 2250 NBR 70	55	6-01-021	Clamp
3	6-00-001	Crankcase	56	6-02-014	2 <sup>nd</sup> 3 <sup>rd</sup> Stage Tube diam. 8 (D)
4	6-00-009	Crankcase Cover (Big)	57	6-02-015	Bracket
5	OR-2300	O Ring 2300 NBR 70	58	VITE0525	Screw T.C.B. inox 5x25 DIN931
6	6-00-011	Bearing - 6302 - 42x13x15	59	DA005	Nut inox M5 high
6	6-01-006	Bearing Connecting rod sce 188	60	VITE0660	Screw T.C.E. zinc. 6x60 DIN912
7	6-00-003	Crankshaft	61	6-03-008	Head 3 <sup>rd</sup> Stage
8	6-00-002	Race	62	6-03-009	Copper gasket valve 3 <sup>rd</sup> Stage
9	6-00-005	Counterweight	63	6-03-001	Cylinder 3 <sup>rd</sup> Stage
10	6-00-006	Key	64	OR-2093	O-Ring 2093 NBR 70
11	6-00-012	Fan flange	65	VITE0655	Screw T.C.E. zinc. 6x55 DIN912
12	6-00-004	Oil seal 15x35x7	66	6-03-003	3 <sup>rd</sup> stage piston
13	6-00-013	Oil seal 14x35x7	66/A	6-03-004	piston ring 3 <sup>rd</sup> stage
14	6-00-021	Counterweight	67	6-03-005	Connecting rod 3 <sup>rd</sup> Stage
15	6-00-019	Cooling Fan	68	6-03-006	Piston Pin 17x7
16	6-00-018	Fan Shroud	69	SC000345	Intake filter cartridge
17	VITE0630	Screw T.C.E. SS 6x30 DIN 912	70	6-01-010	Valve body 3 <sup>rd</sup> Stage
19	6-00-020	Clamp	71	6-02-010	Spring valve 2 <sup>nd</sup> and 3 <sup>rd</sup> Stage
20	VITE0614	Screw T.C.E. zinc 6x14	72	6-02-009	Disc valve 2 <sup>nd</sup> and 3 <sup>rd</sup> Stage
21	6-01-008	1 <sup>st</sup> Stage	73	VITE0680	Screw T.C.E. zinc. 6x80 DIN912
22	6-01-009	1 <sup>st</sup> Stage Head	74	6-04-003	Cylinder 4 <sup>th</sup> Stage
23	6-01-001	1 <sup>st</sup> Stage Cylinder	75	6-01-025	Gasket cap head
24	OR-2325	O-Ring 2325 NBR 70 (82,28x1,78)	76	OR-2106	O-Ring 2106 NBR 70
25	6-01-005	Connecting Rod 1 <sup>st</sup> Stage	77	6-04-005	Connecting rod 3 <sup>rd</sup> Stage
26	6-01-003	Piston diameter 78	78	6-04-004	4 <sup>th</sup> stage piston
27	6-01-007	Wrist Pin 1 <sup>st</sup> Stage (36x12)	79	6-04-006	Piston pin 22x7
28	SEEGERJ12	Circlip SEEGERJ12	80	SEEGERJ7	Circlip SEEGERJ7
29	6-01-015	1 <sup>st</sup> Stage Head Cover	81	6-04-007	Head 4 <sup>th</sup> Stage
30	SC000360	Intake Filter MCH 6	82	6-04-008	Copper gasket head 4 <sup>th</sup> Stage
31	6-01-010	Valve body	83	6-02-009	Disc valve 2 <sup>nd</sup> and 3 <sup>rd</sup> Stage
32	6-01-013	Spring	84	6-02-010	Spring valve 2 <sup>nd</sup> and 3 <sup>rd</sup> Stage
33	6-01-012	Valve plate	85	6-00-014	Oil plug
34	6-01-011	Intake valve seat	86	OR-4081	O-Ring 4081 NBR 70 SH
35	6-01-013	Spring	87	6-00-016	Oil dipstick
36	6-01-014	Discharge valve seat	88	6-00-017	Felt
37	6-00-031	Race	89	VITE0616	Screw T.C.E. inox 6x16 DIN912
38	RACC1014	Elbow diam. 10 1/4 C3XS10-1/4	92	VITE1014	Screw T.C.B. inox 10x14 DIN931
39	6-01-019	1 <sup>st</sup> Stage Tube diam. 10 (D)	93	GUAR1225	Copper gasket 12,5x25,5x1
40	VITE0670	Screw T.C.E. zinc. 6x70 DIN912	94	VITE0616	Screw T.C.E. zinc. 6x16 DIN912
41	6-02-006	Head 2 <sup>nd</sup> Stage	95	VITE 0625	Screw T.C.E. zinc. 6x25 DIN912
42/A	6-02-004	Copper gasket 2 <sup>nd</sup> Stage	96	VITE0630	Screw T.C.E. zinc. 6x30 DIN912
42/B	6-02-007	Copper gasket 2 <sup>nd</sup> Stage	97	VITE0620	Screw T.C.E. inox 6x20 DIN912
43	6-02-001	Cylinder 2 <sup>nd</sup> Stage	98	6-00-023	Pulley
44	OR-40x2	O Ring 40x2 NBR 70	102	6-01-018	Suction valve assembly
45	6-02-003	Piston diam. 38	103	6-01-020	Pressure valve assembly
46	6-02-005	Connecting Rod 2 <sup>nd</sup> Stage		6-03-004	Teflon piston ring 3 <sup>rd</sup> Stage
47	6-02-002	Wrist pin 31,5x12			
48	SEEGERJ12	Circlip SEEGERJ12			
-49	6-02-008	Valve Body 2 <sup>nd</sup> Stage			
-50	6-02-010	Valve Spring 2 <sup>nd</sup> and 3 <sup>rd</sup> Stage			
-51	6-02-009	Valve Plate 2 <sup>nd</sup> and 3 <sup>rd</sup> Stage			
52	6-02-011	Elbow cylinder 2 <sup>nd</sup> Stage			
53	6-03-012	Safety valve 3 <sup>rd</sup> Stage			



## 10 Activated charcoal filter and condensation separator components:

N	Part Number	Description	N	Part Number	Description
1	6-05-001A	Pressure Gauge	17	6-05-017	Filter Bottom Cap
2	6-05-002	Separator Upper lid	18	6-05-018	Filter Top Cap
3	OR-136-4112	O-Ring	19	6-05-019	Frame Handle
4	6-05-015	Safety valve, complete A: Front Regulation Body B: Spring C: Internal body D: O-Ring E: Central body F: Nylon Seat G: Spring H: Link I: O-Ring	20	SC000340	Charcoal Filter Cartridge
5	6-05-005	Condensation Separator	21	6-05-021	Filter
6	06-1890	Elbow, 6 1/8 diameter	22	VITE0608	Screw
7	6-05-007	Tube, diameter 6	23	SC000460	Fill Whip (4 ft)
8	6-05-008	Clamp	24	6-05-024	DIN 3000 psi filling fitting O: Knurled ring P: Fitting
9	VITE0630	Allen Screw	25	6-05-025	Fill assembly L: Body N: Knob M: Yoke
10	RON6I	Washer	26	6-05-026	Filter clamp
11	DA0062	Nut	27	6-05-027	Filter spring
12	RACC0618	Fitting 6-1/8 diameter	28	VITE0610	Screw
13	6-05-013	Tube (S shape), 6 mm diameter	29	6-05-029	Frame
14	6-05-014	Filter Bottom Cap	30	6-05-030	Rubber feet
15	6-05-004	Condensate Drain	31	VITE0812	Screw
16	6-05-016	Separator Diffuser	32	RON8I	Washer
			33	6-05-033	Clamp
			34	VITE0630	Allen Screw
			35	DA006Z	Locknut
			36	6-05-036	Beltguard



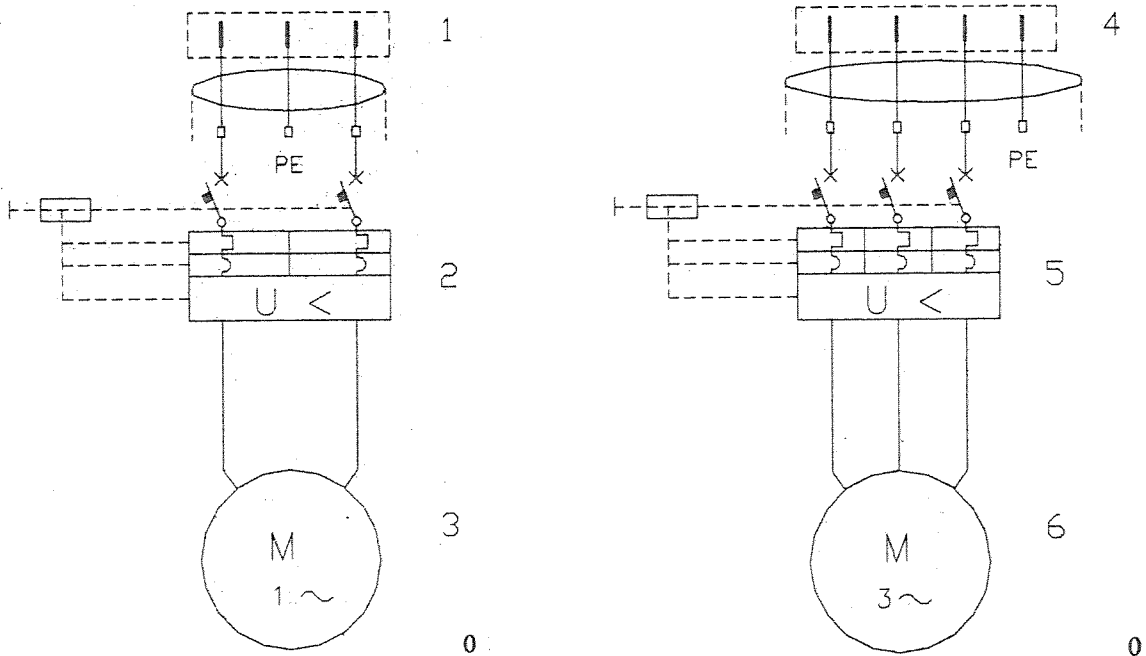
# 11 ENCLOSURE

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## ELECTRIC WIRING DIAGRAM

MCH6/EM

MCH6/ET



Rif.	Components	Type / Drawing / Code	Manufacturers
1	2 p + T 16 A Pin		Commerciale
2	Relay thermomagnetic	ABT WF 200U3 - AZMO1	WEBER PROTECTION
3	Engine	MEC90 2.2kW 230 V 50 Hz	Commercial
4	2p + T Pin	GW 60 008	GEWISS
5	Relé magnetotermico	MS25+BU380	WIMEX
6	Engine	MEC90 3 kW 400V 50Hz	Commercial

