AIR COMPRESSORS

933GB

AC 6000 Series

900a

INSTRUCTION, USE AND MAINTENANCE MANUAL

TI008G0001

ING. ENEA MATTEI SpA
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Versions

- **AC 6000**
- **AC 6000** plus

Voltages/Frequencies

- V 230/50 Hz - V 400/50 Hz
- V 230/60 Hz - V 460/60 Hz

Standard: 3F + ⏚

Plus: 3F + ⏚

The hard copy of this manual will be available for more than 10 years after the end of the production of the relative machine.

Ing. ENEA MATTEI S.p.A. reserves the right to modify the characteristics of the machine subject of this document without prior notice.

This Instruction Manual meets all the requirements of 98/37/EEC Directive.
It is to be considered valid for both the machines with the CE Marking and those without it.

Important Note
This manual should always be used together with the “MAESTRO^{XS} User’s Manual”, code TECA2G-007.

Symbols in the manual

In this manual some symbols are used that to attract the reader's attention and underline some particularly important aspects of the treatment.

The table below gives the list and describes the meaning of the different symbols used.

SYMBOL	MEANING and NOTES
098 	**Danger** It indicates a danger with the risk for accident, even fatal, for the user. Pay careful attention to text block with this symbol.
!	**Warning** It warns against a possible deterioration of the machine or personal item of the user.
	**Notice** It shows either a notice or a note on the key functions or useful information.
	**Further information** This symbol introduces text blocks containing further information. This information has no direct relationship with the description of a function or with procedure development. They could be cross-references to other documents or other sections of this manual.
	**Damage risk** It indicates a high damage risk of a piece, for example, using a wrong tool or by mounting something with the incorrect procedure.
	**Visual Check** It recommends the reader to carry out a visual check. This symbol can also be found in the instructions for use. The user is required to read a measure value, to check some warning signs, etc.
	**Acoustic Check** It recommends the reader to carry out a sound acoustic check. This symbol can also be found in theinstructions for use. The user is required to listen to an operational noise.

Purpose of Document

This manual contains the technical characteristics, the performance, the transportation and installation rules, the instructions for use, and the preventive and corrective maintenance operations of the machine manufactured by **Ing. ENEA MATTEI** S.p.A.

☞ **NOTE : This manual should be considered an integral part of the machine, and should stay with it during the entire life span of the equipment.**
Keep this manual and all of the attached documents in a place easily accessible to all staff in charge of the control or the maintenance of the machine.
Ing. ENEA MATTEI S.p.A. **reserves the right to subject the supply of further copies to the repayment of charges and the acceptance of special provisions with respect to the legitimate defense of intellectual, patent, and executive identity and functional property of the product and/or its parts.**
It is understood that forwarding all or part of this manual to third parties is not tolerated unless with the prior written consent of Ing. ENEA MATTEI S.p.A. **for both the text, the illustrations and the diagrams attached.**
Ing. ENEA MATTEI S.p.A. **reserves the right to make changes without prior notice. Any change, supplement or suppression of elements, components, functions or cycles of the machine, not previously agreed upon with Ing. ENEA MATTEI** S.p.A. **releases the manufacturer from any responsibility whatsoever.**

This manual is for the user and the service engineer of the machine, and it aims at supplying them with the basic technical data typical of the system, a technical description of the several operating groups that form it as well as the essential use procedures and the information necessary to perform preventive and corrective maintenance.

This manual is for staff with a sound knowledge of the processing technique, of mechanical and electrical diagrams, and is for both those in charge for the use of the machine and the service engineers.

This manual is an integral part of the machine and contains information that aims at granting all staff safe working conditions and guaranteeing perfect efficiency during the life span of the machine.

For a correct use of the machine, it is assumed that the working environment is adequate to current regulations concerning safety and hygiene.

Applied directives and technical standards

The machine has been designed, made, and inspected in compliance with the “safety and health essential requirements” stated in attachment I to the **European Directive 98/37/EEC**.

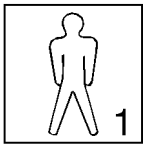
The list below gives the reference Standards used by **Ing. ENEA MATTEI** S.p.A. to design, make, and to make the final inspection of the machine.

List of Directives and Technical Harmonized Standards

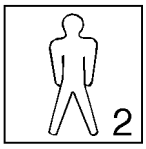
MACHINERY DIRECTIVE 98/37/EEC
ELECTROMAGNETIC COMPATIBILITY (EMC) DIRECTIVE 2004/108/CE
LOW VOLTAGE DIRECTIVE 2006/95CE
EN 1012-1 Compressors and vacuum pumps – Safety Requirements - Compressors.

Required Qualifications for Operators

The operator in charge of the operation or the maintenance of the machine should have all the professional requirements specific to each foreseen operation.
The operator should be trained and aware of his responsibilities.
Below is the description of the professional profiles concerning the operators in charge of the machine

099 

Entry Level Machine Operator (Qualification 1)
Qualified staff able to carry out simple tasks, i.e. to operate the machine with the use of controls on the push-button, and to carry out typical simple functions of adjustments, start or stop.

100 

Second Level Machine Operator (Qualification 2)
Qualified staff able to carry out the task of qualification 1 and also to operate the machine with disconnected safety protections to perform specific adjustments, start or stop functions.

☞ ***Important***
This qualification includes those responsibilities typically subdivided into two separate qualifications. For the operator in charge of our machines, a specialization course is held to train the operator to be able to perform all of the actions necessary to operate the machine even with some of the protections disconnected. However, this requires a certain competence by the operator and extreme care by the manager of the factory so that the said operator carries out only the established operations.

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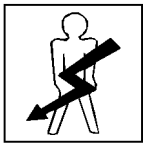
Mechanical Service Engineer
A qualified engineer able to operate the machine under normal conditions, to operate it with disconnected protections, to intervene on mechanical parts to carry out all adjustments, carry out maintenance and all of the necessary repairs.
This person is not empowered to carry out interventions on electrical systems with live voltage.

102 

Electrical Service Engineer
A qualified engineer able to operate the machine under normal conditions, to operate it with disconnected protections. He/she is in charge of all electrical adjustments, maintenance and repair.
He/she is able to operate with live voltage inside cabins and shunt boxes.

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The Manufacturer's Engineer
qualified engineer from the manufacturer to perform complex operations in special situations or according to that which has been agreed upon with the user.

Identification data of the Manufacturer and the Machine and the location of the nameplate "CE MARKING"

Ing. ENEA MATTEI S.p.A. is identified as the machine's manufacturer in conformity with the laws in force with the following acts:

- Declaration of conformity - CE Marking – Instruction Manual

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A specific plate on the machine gives the following indelible information on the **CE MARKING**:

Model
Code
Serial number
Year of manufacture
Delivery
Pressure
Power
Number of runs
Dryer
Tank Capacity
Total Weight
Name and address of manufacturer

The "CE MARKING" plate has been applied at the base of the machine.

The relevant "**DECLARATION OF CONFORMITY**" has been attached.
It is forbidden to remove the "**CE MARKING**" plate and/or exchange it for other plates of machines of the same model supplied to the Customer or the operator.
Should the "**CE MARKING**" plate be accidentally damaged or removed from machine, the customer is required to inform the Company.

General notes on delivery

Upon receipt of the machine please check that:
The supply complies with the order specification.
There are no damages due to transportation or other reasons.
(In the event of damage or missing parts, please inform immediately and in detail the forwarding agent or **Ing. ENEA MATTEI S.p.A.**)

ALWAYS STATE THE MACHINE SERIAL NUMBER AS WELL AS THE PRINT NUMBER OF THIS CATALOGUE WHEN MAKING ANY REQUEST TO Ing. ENEA MATTEI S.p.A. OR ONE OF THEIR SERVICE CENTRES.

Final inspection

The manufacturer carries out the final inspection of the machine directly, during the production phases, in compliance with the company quality system.
A certificate of conformity is supplied together with the machine.
Ing. ENEA MATTEI S.p.A. is responsible for the machine under its original configuration.
Ing. ENEA MATTEI S.p.A. refuses any responsibility for improper use of the machine, for damages due to operations which are not described in this manual or unreasonable jobs.

Safety precautions

The final user should comply with the instructions given by the seller, concerning:

- safety devices already installed on the machine
- instructions for correct machine installation
- correct use and periodic maintenance of all the machine components, including safety devices
- regulations of current laws

The following safety precautions define both the behaviour and obligations to be observed when carrying out the activities listed in the manual, the instructions for the machine use and the way how to operate under safety conditions, for the staff and the surrounding environment.

Machinary Directive
Machinary Directive means the DIRECTIVE OF THE EUROPEAN COMMUNITY COUNCIL 89/392/CEE dated 14th June 1989 and its subsequent amendments that modify its content 91/368/CEE dated 20th June 1991, 93/44/CEE dated 14th June 1993 and 93/68/CEE dated 22nd July 1993.
In June 1998 the Machinary Directive and its subsequent amendments were included into Directive 98/37/CEE without modifications.

Machine
Machine means the functional assembly composed of: control unit, processing unit, working and resting equipment, systems (electrical, pneumatic, hydraulic, cooling, lubrication systems) and any group completing the system functionality.

Working area
Working area means the protected volume limited by guards to prevent injuries and aimed at operation during the machine processing.

Authorized staff
Authorized staff means personnel duly trained and appointed to perform the activities listed below and that make up the operating instructions for the machine.

Appointed staff
Appointed staff means the personnel who, although not participating materially in the work, supervise the work of others, for example the responsible engineer.

Transport
Transport means all those operations regarding the handling of the machinery or part of it

Installation
Installation means the mechanical, electrical and fluid system integration of the machine into a production reality, in compliance with specified requirements.

Commissioning
Commissioning means the functional check of the machine installed.

Operation
Operation means the operating mode at which the machine produces compressed air according to all settings and controls inserted by the control device.

Decommissioning
Decommissioning means to disconnect mechanically and electrically the machine from a production line.

Dismantling
Dismantling means dismantling and eliminating the machine components.

Maintenance and repair
Maintenance and repair means the regular check and/or replacement of parts or components of the machine and any action to identify the cause of failure, ending with the machine resetting to the design operating conditions.

Improper use
Improper use means using the machine out of the limits specified in the technical documentation.

Applicability
The regulations should be applied when performing following activities:
- Transport, installation and setting up
- Manual operation
- Continuous operation
- Decommissioning and dismantling
- Maintenance and repair

that compose the use procedures foreseen for the machine.

Installation and commissioning

“The installation and commissioning are only permitted to authorised staff.
During installation, handle the machine components as indicated in this manual; if lifting is necessary, verify first the correct fixing of specific devices for lifting and use adequate slings and equipment.
The machine installation should be as free as possible from any material preventing or limiting its view.
If there are any, remove fixing brackets or eyebolt blocking devices, previously fitted to allow the transport.
Check that all the machine safety devices are correctly fixed and there are no moving or loose parts. Also check soundness of the control unit components.
Connect the machine pneumatic system to the air distribution system and carefully check that pressure is set to the correct value.
Check consistency between the voltage set on power transformers and the voltage value of the electrical supply.
Before connecting the machine electrical system, check that the mains isolator is blocked in the open position.
Verify that accident preventing guards are correctly installed and in perfect state.
According to the different national law regulations, the Customer might be required to inform the Certified Authorities of the installation and set up and/or to undergo a system check if the machines are provided with tank (SPV) or pressure devices (PED).
Periodic inspections are also foreseen.

☞ **The machine safety is not guaranteed in case of removal, by-pass or tampering of the safety devices on the machine.**

To stop the machine during an emergency, press the emergency stop button.

Operating the machine

Only authorised and duly trained staff or at least with a sufficient technical experience should operate the machine. The staff in charge of operating the system should be aware that the knowledge and application of safety regulations is in an integral part of their job.
Unskilled personnel should not access the operating area and the machine control panel when the system is live.

Before starting the machine, carry out following operations:

- Carefully read the technical documentation;
- Get information about the operation and position of emergency stop devices on the machine;
- Know which protections and safety devices are fitted on the machine, their position and operation.

It is forbidden to either disconnect or partially remove the protections and safety devices. The same applies for danger signals located in particular areas of the machine. It is strictly forbidden to access the working area and the control and power cabins during operation of the equipment (even partial) or immediately after it is switched off.
Protections and safety devices should be kept in perfect state so as to allow right operation; in case of failure they should be repaired or replaced.
The use of not authorised components and accessories for the protections and safety devices may lead to malfunctioning and dangerous situations for the operating staff.

Decommissioning and dismantling
Only authorised staff is allowed to decommission and remove the machine.
Before setting the machine out of operation it is necessary to disconnect the mains isolator and block it in the open position.
Discharge oils and fluids, remove all moving parts.
Disconnect the mains isolator cable, by cutting out the power wires and then the earth wire.
Disconnect the power supply cable from the machine main switch and remove it.
Disconnect the machine pneumatic equipment from the air distribution system.
Remove the machine from the working area following the instructions given in this manual. Before lifting it, verify the correct use of lifting devices and use only suitable equipment.

Waste disposal should be performed in compliance with the laws in force in the country where the machine is installed.

- ❑ Installation, setting up and use of compressor should be carried out in compliance with the standards and the rules in force concerning safety at work.
- ❑ The owner of the machine is responsible for its good maintenance, an essential condition to ensure safe operation.
  Those machine parts that due to improper use or wear do not ensure safe operation should be quickly replaced.
- ❑ Only trained, authorised and skilled staff should perform the installation, use, maintenance and repairs.
- ❑ In case of difference between the instructions given in this manual and those foreseen by current laws concerning safety, it is recommended to apply the more restrictive ones.

Maintenance and repair
Only authorised personnel should carry out maintenance, troubleshooting and repairs.
Any maintenance and repair in progress should be signalled by a specific sign, stating the maintenance condition and placed on the control panel until completion of the job, even if temporarily interrupted.

All operations for installation, maintenance or replacement of components on the machine or on the control unit should be performed with switched off system.
Therefore, the main switch should be on OFF (OPEN) position and blocked with the safety lock to prevent any movement to the ON position.

For compressors equipped with INVERTER, before performing any maintenance job, wait at least
5 minutes after you have disconnected the electricity supply.

Before acting, people in charge of maintenance should first check following conditions:
• that any receiver under pressure has been exhausted.

Before intervening on pneumatic or lubricating systems and specifically on pipes, receivers, hoses and other components under pressure, the staff in charge of maintenance should reduce the internal pressure of the plant down to the ambient pressure value.
Faulty components must be replaced with others having the same code.

If during troubleshooting it is necessary to carry out jobs with the control unit and the machine live, all precautions should be taken, as required by the safety standards to operate under dangerous voltages and with moving parts.
At the end of the maintenance and troubleshooting jobs, all disconnected safety devices should be reset.
Maintenance, repair and troubleshooting should be ended by the checking of the machine operation and of all its safety devices.

Settings to be made by customer

Unless different contractual agreements are taken, the following items are normally at customer's expense:

- ❑ room preparation (including building works, such as foundations or canalizations, etc, if required);
- ❑ anti-slip, levelled flooring;
- ❑ observing the dimensions given in the layout drawing when preparing the site and when installing the machine itself;
- ❑ preparation of auxiliary services, suitable for the system requirements (such as electricity supply, pneumatic system, etc)
- ❑ preparation of the electrical equipment in compliance to Directive 2006/95/EEC;
- ❑ adequate lighting complying with EN 60204-1 Standard;
- ❑ any safety devices upstream and downstream of the electrical supply lines (like differential switches, earthing systems, safety valves, etc) foreseen by the current laws in the country of installation;
- ❑ earthing equipment complying with CEI 64-8 Standard;

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For any kind of information on the use, maintenance, installation, etc. **Ing. ENEA MATTEI S.p.A.** is always available to meet the Purchaser's requests.

However, any enquiry should be made in clear terms, with references to this manual and always stating the data on the machine id plate.

For any communication with the service centre, always indicate the machine model, the serial number and year of manufacture, helping to identify every single machine and, when possible, specify the kind of problem or the defect found, for instance: electrical, mechanical fault or defects in the machining quality, and describe the same in the "**TECHNICAL SERVICE REQUEST FORM**" enclosed to this manual.

Please contact the nearest local service department, or refer to the headquarters in Italy.

Instructions on how to order spare parts

In the course of time a machine may need the replacement of those parts subject to wear.
The Purchaser may order the parts to be replaced.
It is compulsory to always buy original spare parts.

To order spare parts always indicate following data with the utmost accuracy:

1 Machine type and model
2 Serial number
3 Exact description of the item
4 Code and/or reference (if available)
5 Quantity

To simplify and speed up the delivery of spare parts, it is suggested to forward orders by compiling the "**SPARE PARTS REQUEST FORM**" enclosed with this manual and send it to **M.T.A. S.p.A.** or to the closest distributor.

The manufacturer's address

Any request for intervention of the technical service by the customer or explanations on technical aspects of this document should be made to:

Technical and Spare Parts Service

075 M.T.A. S.P.A. MECCANICA TECNICA ASSISTENZA
Corso Italia, 47 – 24049 VERDELLO - ZINGONIA (Bergamo) - Italy
TEL: +39 - 035/4186400 (Automatic search) FAX: +39 - 035/4186490
e-mail: info@mta.bg.it
C.P. N° 69 Zingonia

098 **To operate the machine under any operating condition, including maintenance, it is not necessary that more than one person be present.**
Using more than one person is superfluous and, in any case, not allowed for safety reasons.

! The employer should instruct the staff on the risks of accidents, on safety devices and on the general rules concerning prevention and protection, as established by the European Community Directives and by the current legislation in the country where the machine is installed.
The operator should be aware of the location and operation of all controls and of all the machine features.
The operator should also have read the entire manual.
Only skilled engineers should carry out maintenance jobs, after having duly prepared the machine.

098 **Any unauthorized tampering or replacement of one or more parts of the machine, or the adoption of accessories that modify the use of the machine and the use of different materials than those recommended in this manual, may be a potential risk of accidents.**
It is strictly forbidden for the machine to be operated by two persons contemporaneously, one inside the guards and one on the control panel.

Dangers and residual risks

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During the design phase all hazardous areas have been considered and, therefore, all necessary precautions have been taken to avoid risks to people and damage to the machine components.
To guarantee both health and safety of those exposed, the machine is equipped with appropriate safety devices:
- EMERGENCY button to stop the machine immediately
- Fixed protections. located in areas with exclusive access for routine maintenance. They are fixed by devices that need special tools for their removal, or they are locked with screws.
- Protection and segregation of the electrical/electronic driving equipment of the machine by metallic box, to avoid accidental contacts with live equipment in case the metallic box is open; the electric box is IP 54 protected; IP 20 is the protection degree of the internal devices against accidental contact.
- Suitable panels or protection to cover moving parts.
- Electrical devices to detect faults of the machine electrical supply and malfunction of motor electrical devices.

098 **WARNING !!!**
For compressors equipped with INVERTER, before performing any maintenance job, wait at least 5 minutes after you have disconnected the electricity supply.

098 **WARNING !!!**
Our machine IS NOT SUITABLE for use in areas with potentially explosive atmosphere.

After having carefully considered all possible risks concerning the use and maintenance of the machine, all measures have been adopted to eliminate risks and limit dangers to exposed people.
Although the machine is equipped with safety devices, the following residual risks remain, which can be eliminated or reduced by the relevant precaution:
• Risk of bruises, tearing, cuts during the handling of tools and/or elements.
• Risk of bruises during machine intervention.

Operation

- ❑ **The operator should use the personal protection devices.**
- ❑ Use the compressor only for the kind of application for which it is designed (air compression for industrial use).
- ❑ Before starting, ensure that compressor is filled with oil.
- ❑ Please refer to Section 8 of this manual for the oil type to be used.
- ❑ Never operate the compressor if there is a possibility of inhaling smoke or toxic or flammable vapours.
- ❑ Never operate the compressor at higher pressures than those indicated in the id plate.
  The air delivered by the compressor must not be used for breathing, although it is filtered and purified from oil.
- ❑ If hoses are used to distribute the air, ensure they are properly sized and suitable for the operating pressure, and not damaged or worn.
  Please remember that rubber hoses should be replaced at regular intervals.
- ❑ Never remove the oil filler plug when the machine is running or there is still pressure inside the compressor: there would be hot oil leak.
- ❑ Although it has an acceptable sound pressure level, the machine can produce a much higher noise if the room is narrow and reverberating. Please note that the continuous presence of an operator is unnecessary.
  For safey against noise, in compliance with local laws in force, and if necessary, place specific warning signs near the machine and equip personnel with suitable protections.

Installation

Besides fulfilment of rules and regulations issued by the authorities, it is recommended to consider the following:

- ❑ The compressor will perform most efficiently if installed in a suitable, well ventilated area and far from heat sources.
- ❑ Should any duct be installed for the suction and cooling of air, always use the data and recommendations given in Section 4 and preferably obtain expert advice during the design stage.
- ❑ In case of outdoor installation (not suggested for very cold climates) it is necessary to place the machine under a roof or covering, to protect it against weather.
- ❑ Be careful that no foreign materials clogg the radiator and cause rises of the operating temperature.
- ❑ The intake air must be clean and free from flammable vapours, which could cause fires or explosions.
- ❑ As the machine is air cooled, adequate ventilation must be ensured to prevent it from overheating and thus avoiding the recirculation of the expelled hot air.
- ❑ Control and safety devices should never be tampered with.
- ❑ If one or more compressors are installed on a single pneumatic line, it is essential that each unit is equipped with a detect valve.
- ❑ Electrical connection should be conforming to current regulations. The machines should be earth connected and protected by a magneto-thermal switch against possible short circuits.
- ❑ It is essential to install a mains isolating switch upstream of the compressor.

Maintenance

The person responsible for operation of the compressor should check periodically that all instructions for operation and maintenance are followed by the operator.

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WARNING !!!
Fill in the specific "Maintenance Sheet" supplied with the machine.

Only trained staff should carry out maintenance, with the compressor off and with no pressure inside the same. Also disconnect the compressor from the pneumatic equipment.
Cut out the electricity supply by acting on the mains isolator located upstream of the compressor electric board and indicate with a special sign that the machine MUST NOT BE RESTARTED.

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WARNING !!!
An adequate cleaning of both the machine and the place where it is installed is highly recommended.
For cleaning DO NOT USE flammable fluids or products not complying with current regulations.
In case of doubts about the compressor operation or of any of its components, it is recommended to contact the after sales service of Ing. Enea Mattei S.p.A.

The following should be also considered:

- ❑ Before intervening on the machine, disconnect the electrical supply by means of the mains isolator. In fact, the machine is equipped with an automatic start system, starting the same at any time, if required by the compressed air system.
- ❑ The key for opening/closing the electric box doors should be given only to skilled personnel.
- ❑ Maintenance operations should be always carried out with compressor not operating.
- ❑ Before carrying out any job on the compressor unit, ensure through the gauge that there is no pressure inside.
- ❑ Only use suitable tools for the kind of job.
- ❑ Never use solvents and flammable products to clean the machine or individual parts.
- ❑ Never carry out weldings or other jobs requiring considerable heat near the machine, specifically near the electrical system and the oil circuit.
- ❑ Do not make modifications or weldings on vessels under pressure.
- ❑ Do not leave tools, rags or other loose items on the motor or on the compressor.
- ❑ The lubricating oil, especially if exhausted, may damage the skin: protect hands with gloves or specific protecting products for the skin.
- ❑ Do not wear clothes contaminated by lubricating oil
- ❑ Absolutely avoid contaminating the ground with lubricating oil.
- ❑ To prevent pollution, store the exhausted lubricant into suitable containers and in a safe place. For oil disposal follow what suggested by internal rules and current regulations.
- ❑ In case of topping up, use the same oil as already contained in the machine.
  Mixtures are harmful for both the oil and the compressor life.
- ❑ After any maintenance, start the machine and check that all control, stop or alarm devices are working correctly; also verify that temperature and pressure values are the correct ones.
- ❑ Make checks and overhauls as foreseen in this Manual, and use only original spare parts.
  Failing to make checks or using non original spare parts may cause problems that jeopardize the machine operation and the manufacturer's warranty will be no longer valid.

Responsibilities

Ing. Enea MATTEI S.p.A. refuses any responsibility for injuries to people, animals or damages to objects, caused by:

- ❑ non-observance of the mentioned precautions;
- ❑ improper use of compressed air or of the machine in general;
- ❑ non-observance of normal safety regulations or domestic rules in the work field;
- ❑ non-observance of the instructions during handling and transport of the machine;
- ❑ wrong machine installation;
- ❑ defects due to the electric power distribution;
- ❑ lacks in periodic maintenance;
- ❑ unauthorised jobs or modifications;
- ❑ use of non original or unsuitable spare parts for the involved model;
- ❑ non-observance of the instructions, even if only partially;
- ❑ possible inefficiencies caused by malfunction or non-use of the compressor

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WARNING !!!
It is recommended to use the compressed air delivered directly by compressors only for manufacturing processes. For any other use, please ALWAYS CONTACT the distributor, the technical service or the manufacturer BEFOREHAND.

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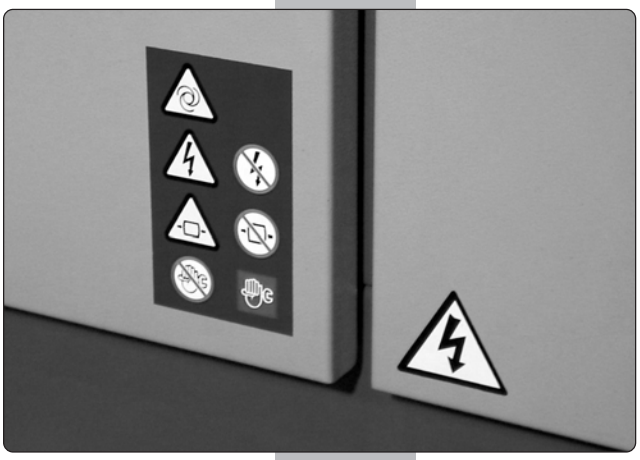

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Description of Pictograms

Pictograms have been applied on the machine to explain following situations:

Danger
Obligation
Prohibition

Special indications (example: direction of rotation of the fan, etc)

Many accidents are often caused by the non-observance of the simplest safety rules or poor knowledge of the instructions given by the manufacturer.

To avoid possible danger situations, some of them are highlighted through special signs represented by suitable standardized symbols (pictograms).

Below is the list of the most common symbols applied to our machines:

Danger pictograms
These triangular signs are framed in black with a yellow background and the symbol is black.

105

Warning !
The machine is with remote control or with automatic system and may start without notice.

106

Warning !
Vessel under pressure.

107

Warning !
Risk of high temperature surface (> 70 °C)

108

Warning !
Air delivery.

109

Warning !
Risk of electrical shock.

Prohibition pictograms
These circular signs are framed in red, with white background and the symbol is black.

110

No working on the machine.

111

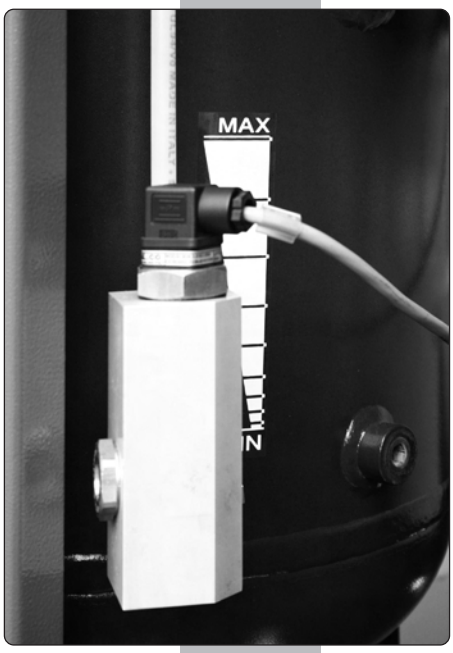
No pressure in the receiver.

112

No voltage.

003

908



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Possibility to carry out jobs.

Description of Pictograms

Obligation pictograms
These are circular signs on a blue background, and the symbol is white.

113

Read the instructions manual before carrying out any operation on the machine.

114

Use individual protective means against noise.

Indication pictograms
These signs may vary in shape and they give useful information.

115

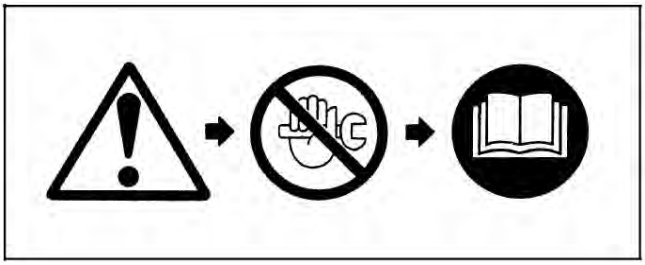
Direction of rotation.

116

Lifting point.

209.2

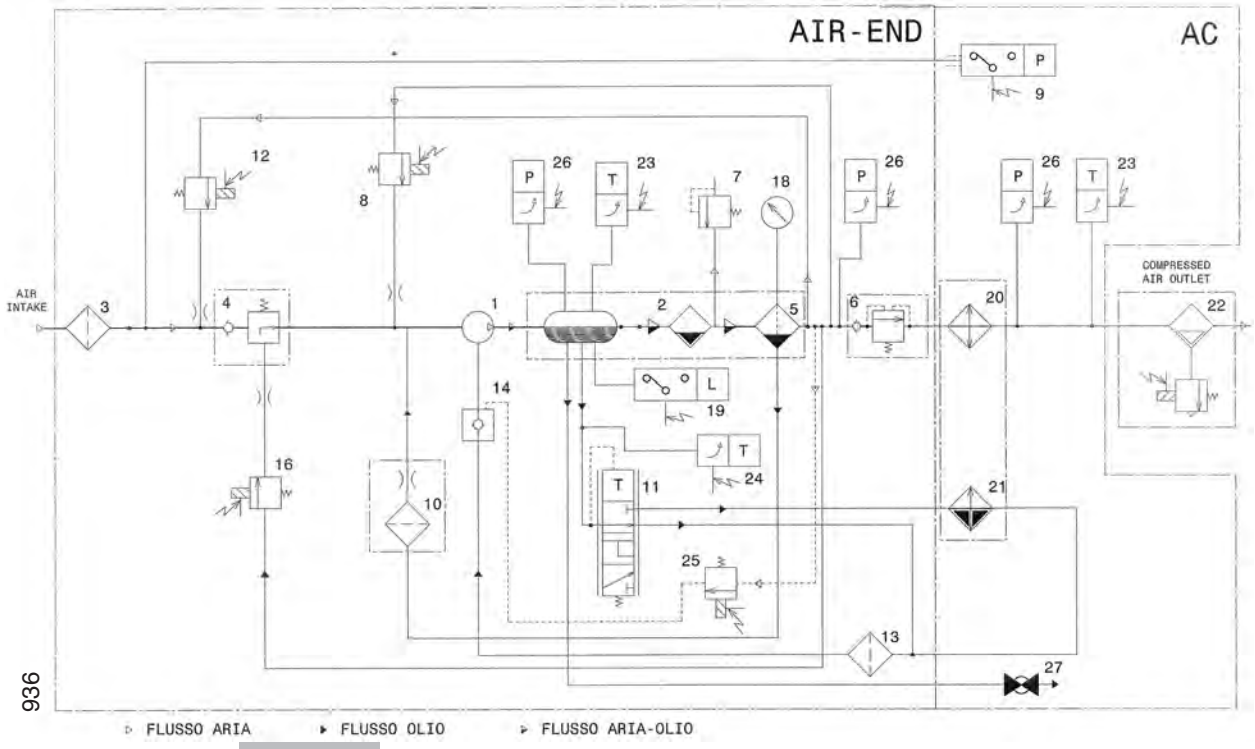
Oil level



118

Combination of pictograms
The above shown combination of pictograms means:
Warning ! Please refer to the Instruction Manual before starting any activity.

Mattei rotary compressors of the AC Series are the result of over 80 years of investments in research and development, to improve performance continuously, and at the same be environment-friendly.
The modulation operating mode is not available for compressors of the AC 6000 series.
Designed for continuous industrial service, they guarantee constant performance over time, low energy consumptions, reliability, functionality and easy maintenance.
The compressor is supplied complete with all components described below and equipped with optional devices.
Unless differently required, the unit is filled with Mattei Rotoroil 8000 F2 synthetic lubricant.
For special requirements regarding lubricant, please refer to section 8 of this manual.



936

1	COMPRESSORE ROTATIVO A PALETTE	1	ROTARY VANE COMPRESSOR
2	CAMERA OLIO - SEPARATORE PRIMARIO	2	OIL CHAMBER - PRIMARY SEPARATOR
3	FILTRO ASPIRAZIONE	3	INTAKE FILTER
4	VALVOLA ASPIRAZIONE	4	INTAKE VALVE
5	SEPARATORE ARIA - OLIO	5	AIR - OIL SEPARATOR
6	VALVOLA DI MINIMA PRESSIONE E NON RITORNO	6	MINIMUM PRESSURE - NON RETURN VALVE
7	VALVOLA DI SFIATO	7	RELIEF VALVE
8	ELETTROVALVOLA DI SOCCORSO A VUOTO	8	VACUUM RELIEF SOLENOID VALVE
9	PRESOSTATO DIFFERENZIALE	9	DIFFERENTIAL PRESSURE SWITCH
10	VALVOLA DI RITORNO OLIO	10	OIL RETURN VALVE
11	VALVOLA TERMOSTATICA BY-PASS	11	BY-PASS THERMOSTATIC VALVE
12	ELETTROVALVOLA DI SCARICO PRESSIONE	12	PRESSURE EXAUST SOLENOID VALVE
13	FILTRO OLIO	13	OIL FILTER
14	VALVOLA STOP OLIO	14	OIL STOP VALVE
15	TERMOSTATO	15	THERMOSTAT
16	ELETTROVALVOLA DI MESSA A VUOTO	16	OFF LOAD SOLENOID VALVE
17	VALVOLA DI MESSA A VUOTO	17	OFF LOAD VALVE
18	INDICATORE DI PRESSIONE	18	PRESSURE GAUGE
19	LIVELLOSTATO OLIO	19	OIL LEVEL SWITCH
20	REFRIGERANTE ARIA	20	AIR COOLER
21	REFRIGERANTE OLIO	21	OIL COOLER
22	SEPARATORE + SCARICATORE CONDENSA (OPZIONALE)	22	CONDENSATE SEPARATOR + DRAIN VALVE (OPTIONAL)
23	SONDA DI TEMPERATURA ARIA	23	AIR TEMPERATURE SENSOR
24	SONDA DI TEMPERATURA OLIO (OPZIONALE)	24	OIL TEMPERATURE SENSOR (OPTIONAL)
25	ELETTROVALVOLA COMANDO VSO	25	VSO SOLENOID VALVE
26	SONDA DI PRESSIONE	26	PRESSURE SENSOR
27	VALVOLA DI SCARICO	27	DRAIN VALVE

937

902a

All components are enclosed in a soundproofing canopy in sheet stell , epoxy powder painted and lined with deadening fire-resistant material.

The canopy has a pre-filter to prevent intake of gross particles that might prematurely clog the radiators and air filter.
Wide detachable panels and hinged doors allow easy access for all.

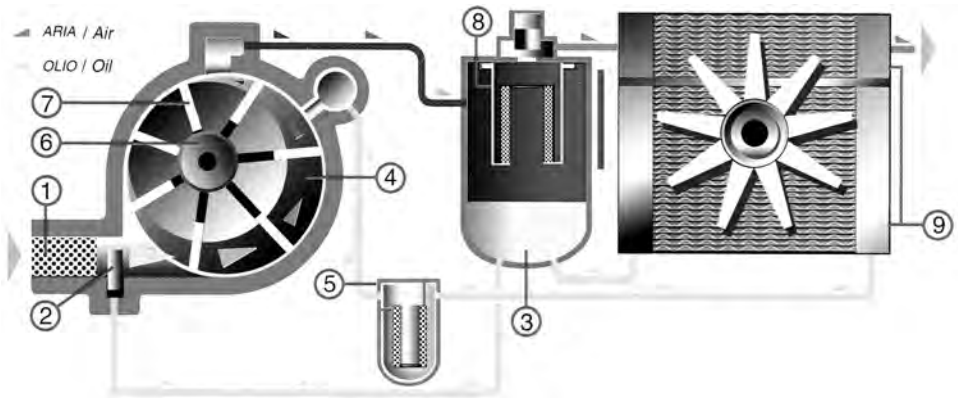
The base has openings to allow easy lifting and handling of the compressor (See Section 4).
Standard packing includes:fixing on wooden pallets,protective polythene cover,and a cardboard box.

Compressor

The vane compressor is a volumetric rotary compressor.
It consists of a cylinder (stator) in which a rotor, mounted eccentrically and tangential with it rotates, and two end covers.
The rotor has longitudinal slots in which the vanes slide.
The vanes are pushed against the stator by centrifugal force.
Sealing of the moving parts, cooling and lubrication are provided by an efficient injection of oil through proper ports, due to the pressure difference between the compression chamber and the oil receiver.
No pump for fluid circulation is needed.
An oil film on the inner surface of the stator prevents direct contact of the moving parts and avoids any wear.
In the vane compressor there are no axial thrusts pushing the rotor against the end covers.
Therefore there is no need for thrust bearings.
The rotor is supported by white metal bearings having a practically unlimited lifetime.
The air, drawn in through a filter, enters the intake valve and is compressed continuously, pulse-free, due to the decrease in volume of the pockets formed by the stator, rotor and vanes.

Intake valve

The intake valve, driven by a hydraulic circuit using the same oil used for lubrication, delivers to the compressor the air quantity required by the distribution system.



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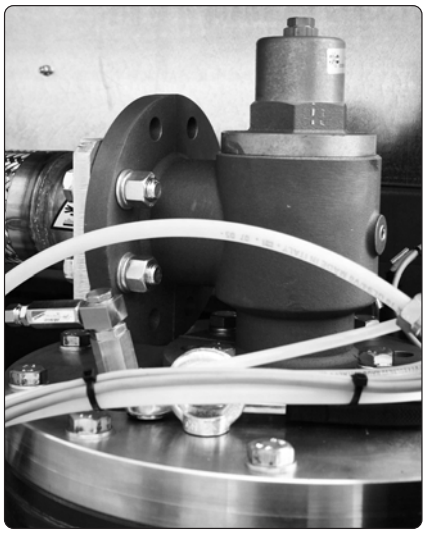
1 - Air filter
2 - Automatic intake valve
3 - Oil chamber
4 - Compression chamber
5 - Oil filter
6 - Rotor
7 - Blades
8 - Coalescing separator
9 - Air/oil cooler (radiator)



910

Minimum pressure and non return valve
Compressed air is delivered by the compressor through a valve ensuring a minimum pressure inside the oil chamber, so as to guarantee smooth operation when the compressor is delivering air.
This valve also prevents the compressed air in the system from returning to the compressor.

Oil separation
The air/oil separation occurs in different stages and ensures exceptionally low oil consumptions.
The main mechanical separation occurs in the oil chamber through a labyrinth path.
This mechanical separation works via the continuous changes of direction of the air flow in the labyrinth path.
The last separation occurs through the coalescing filter, removing the remaining oil vapours from the air.
This particular oil separation system brings to a very reduced oil consumption. The large size of the filter and quality of materials ensure a long life of the filter itself.

Electric Motor
The compressor and the electric motor are connected by means of flexible coupling.
This ensures a perfect alignment, no power absorption, silent operation and no need for maintenance.
Asynchronous, threephase, 4 poles electric motor, with short circuit winding:
- class F insulation
- High Efficiency Class
- IP 55 protection degree
- electrical supply according to IEC 38
- voltage/frequency V 230/50 Hz - V 400/50 Hz
  V 230/60 Hz - V 460/60 Hz

911

Cooling Systems
The compressor is complete with two coolers, entirely made of aluminium and suitable to cool the oil and the compressed air.
An air flow, produced by the fan placed inside the soundproofing enclosure, flows through the coolers and removes the heat generated during the compression phase. The compressed air outlet temperature is slightly over the ambient temperature.
See enclosed technical data.

Electrical Starter
The protection class is IP 54, and it includes
- Star-Delta starter
- Main motor protection (by thermal probe=PTC)
- Fan motor protection (by magneto-thermal switch)
- 110 V transformer for auxiliary circuits
- 24 V transformer MAESTRO^{XS} control device
- Protection fuses for auxiliary and primary circuits of transformer
- Terminal board for the remote restarting of start/stop controls and signals
- Emergency push-button
- Micro-door
- Safety block:
  for high temperature in the compressor, motor overload, oil low level, air and oil high temperature, emergency stop, clogged separator filter, failure in the pressure sensors

Electrical Diagram inside the starter.

Separator receiver

The receiver is supplied with an INSTRUCTION, USE AND MAINTENANCE MANUAL which must be kept and consulted before use, and with a DECLARATION OF CONFORMITY clearly indicating the main technical data and the operating limits.
The receiver is built to contain compressed air and oil; it acts as a separator and, combined with specific filtering elements, as a filter; please always consider the potential risks in case of incorrect use.

No modification should be made either to this receiver or to its installation when setting up the machine.

The maximum operating pressure and temperature for this receiver are shown on the attached plate.

Setting of the safety valve ensures reaching the maximum allowed operating pressure.

The receiver has been designed and manufactured so as to guarantee its long term use.

As shown in the manual supplied with the receiver, an extra thickness is foreseen to avoid any possible corrosion.

In some countries the user should request a Notified Board to inspect the machine during installation and before commissioning the same.

Laws in some countries may also require inspections during operation.

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MAESTRO^{xs} is a programmable control unit which adapts compressor operation to the specific requirements of the air line it is connected to. It features various programming levels and performs operating and fault controls and analysis.
Advanced programming and analysis levels are protected by digital codes to prevent unintentional access.
Maestro xs also contains a memory which saves settings and operating data even if the compressor is disconnected from the power supply or switches off due to a power cut.

Hardware Characteristics

- Microprocessor-based technology
- Ergonomic control panel with rapid access keys to main menus
- Access keys to menus, start/stop and reset keys with Led-controlled indications
- “LCD” display – text with blue leds - 8 lines - 22 types
- 24 V AC 50/60Hz Power Supply
- 24 V dc Digital Inputs
- Digital output with clean contacts up to 230Vac and until 24Vdc
- Analogue output 0-10 Vdc
- Pressure analog signals (4-20mA)
- Temperature analog signals (NPT)
- Interfaces:

❏ RS485 to communicate with other “MAESTRO xs” devices
❏ RS485 (optional) to communicate with supervising PC and lan

Software Characteristics:

- Easy use based on a menu structure
- Updating possibility
- Display of :

❏ Analogue data:

- Line pressure, pressure in the chamber, oil temperature, output air temperature

❏ General data:

- Alarms, operating messages, machine status, maximum and minimum pressure, last start and last stop

❏ Hour counter:

- Display of schedules of activation, start, loading, maintenance warns

❏ Events archive:

- Storage of alarms and blocks, with the indication of the when the alarm was activated, machine status.

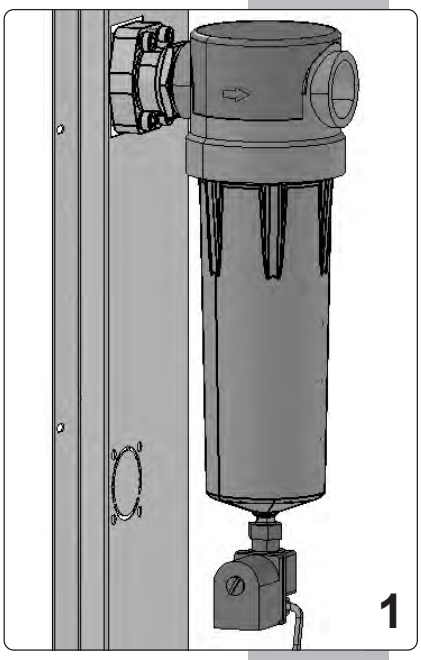
The device allows for:
- User Interface in 8 languages (Italian, English, French, German, Spanish, Polish, Czech, Portuguese)
- Weekly and time schedule of starts and stops
- immediate reading on display of data relevant to the compressor operation:
❏ Compressor hours of activation and line pressure of the equipment
❏ Pressure oil chamber
❏ Output air temperature and compressor oil temperature
❏ Hours of running and hours of loading
- Programming of basic parameters for optimum operation of compressor accessible by user:
❏ Control modes of compressor (Local/remote, master/slave)
❏ Operation modes (Automatic, Continuous)
❏ The advanced programming of parameters, protected by “password” allows the qualified engineer to change those parameters to which the user cannot access directly
- Checking the input and output status of the gear case to detect any failure in the compressor electric equipment
- Storage of up to 20 failure events
- The check of the integrated dryer (plus models)
- The remote control by clean contacts of the machine status below:
❏ Activated compressor (optional)
❏ Running compressor (optional)
❏ Compressor under load (optional)
❏ Compressor blocked (standard)

Communication
MAESTRO^{xs}, connected to the Mattei supervision device (optional), allows for:
- Remote monitoring by web interface
- Alarm signaling by e-mail, fax or mobile phone.

WARNING !!!

The compressor has been designed to compress **AIR ONLY**.

The compression of other gases is FORBIDDEN.



OPTIONALS

The machine can also be customized according to meet different requirements by purchasing specific accessories such as:

Separator and Condensate Drain Kit (Photo 1)

DOCUMENTATION

The machine comes complete with:
1 Use and Maintenance Manual complying with Machinery directive 98/37 CE
1 CE Declaration of conformity
1 Start Report
1 Maintenance Sheet
1 Electrical Diagram (inside the control board)
Documents for the optional accessories

CERTIFICATIONS

Ing.Enea Mattei SpA has its company quality system certified according to standard UNI EN ISO 9001 by DNV while the final inspection procedures comply with standard ISO 1217 and have been certified by TÜV.

Built-in Dryer (versions plus)

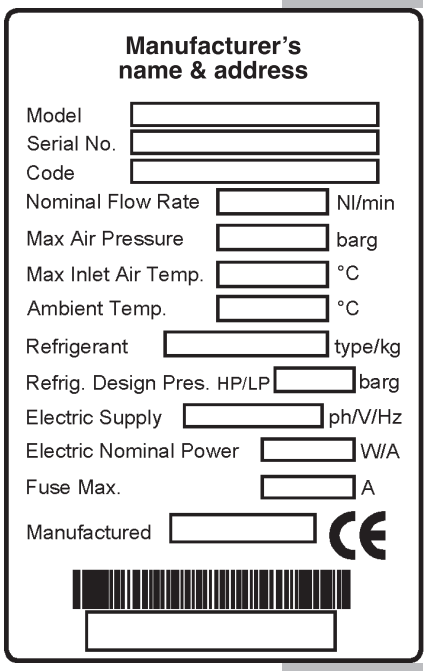
Each AC unit (OPTIMA / MAXIMA) is supplied with a compressed air cooling radiator. Cooling produces condensation that is unloaded from specific separators and drainpipes that can be applied on the front of the machine (see this section Optional Accessories).

Many industrial applications require that the compressed air be almost completely emptied from the water vapour it contains so as to prevent any further condensation from forming inside the line pipes to which it is connected.
Hence, devices that lower the dew point by a few degrees above 0°C should be installed.
In the plus versions the setting up of the machine includes a dryer with a refrigerator cycle that guarantees an adequate compressed air quality.

The design of the compressor allows for integrating a dryer with refrigerator cycle directly installed on the machine.

An electronic controller controls the dryer, which manages its functional parameters according to the different operating load cycles.

For further details on the dryer, please refer to the specific manual supplied with the device.



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ID Plate

The product ID plate contains all the machine's essential data.

Removing or tampering the id plate forfeits the right of guarantee.

Operating Mode

When the compressor is activated, the drier also starts after a preset delay.
Alarms are inserted with 5-minute delay to allow the drier to reach its operating mode.
Once this delay has elapsed, the alarms start and begin monitoring the system.

Once started, the dryer compressor group stays on until the following conditions occur:

✔ The compressor is stopped with the "STOP" push-button

✔ The dryer operating limit conditions are exceeded.

The controller manages the dryer operation by monitoring the dew point temperature that allows the system to run correctly.
The operating limits for such a parameter are as follows:

- ✔ The dew point temperature > 0°C;
- ✔ The dew point temperature < 6°C with Ambient Temperature ≤ 25°C;
- ✔ The dew point temperature < T.amb. – ƒ ambient with Ambient Temperature > 25∞C.

MATTEI sets the ƒ ambient value.

If the dew point drops below 0°C, the controller will indicate the faulty condition [Ice Alarm] while the dryer compressor is kept active throughout the time corresponding to the parameter [Low Temperature Delay Time].
Once this time has elapsed, the dryer compressor is stopped so to prevent any ice from forming.

As soon as the temperature rises again above 0°C, the dryer compressor is re-started and the fault warning is automatically turned off.

Should the dew point temperature rise above the upper limit, the controller will indicate the fault condition [ALARM High Dew Point] for the time that corresponds to the parameter [High Temperature Delay Time].

When the set time has elapsed, the Alarm warning will stay on.

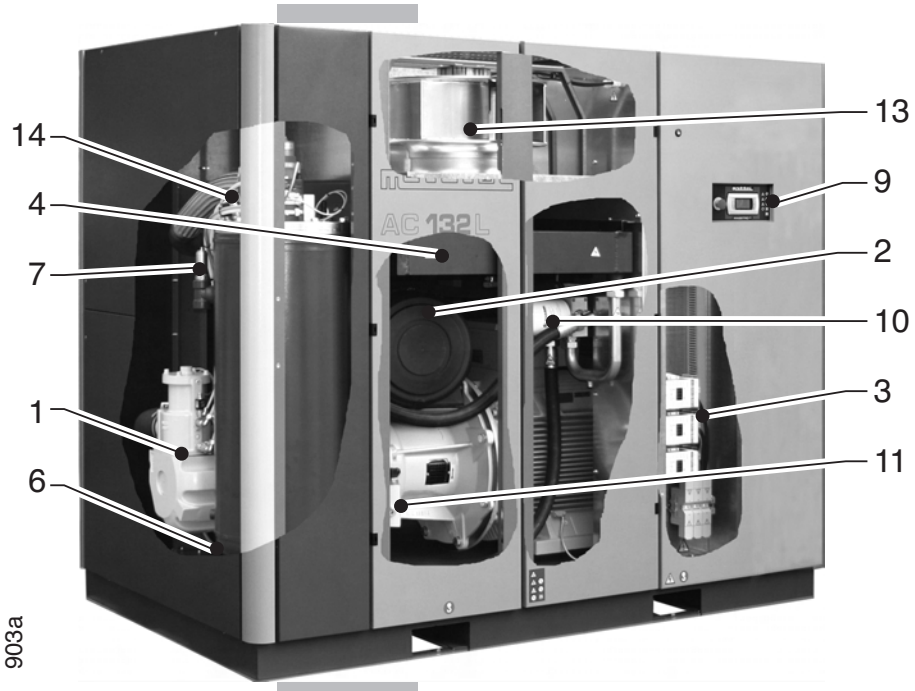
As soon as the temperature falls again within the above-mentioned operating interval, the fault warning will be automatically turned off

NOTE:

The user can request Ing. ENEA MATTEI that the fault in the dryer corresponds to a machine BLOCK.

NOTE:

The design of the dryer prevents condensate from accumulating and ice from forming inside it.
In case of any failure in the dryer, by-passing the device is possible by disconnecting the hose linking it to the air radiator and connecting it directly to the delivery side. All joints installed are equivalent.



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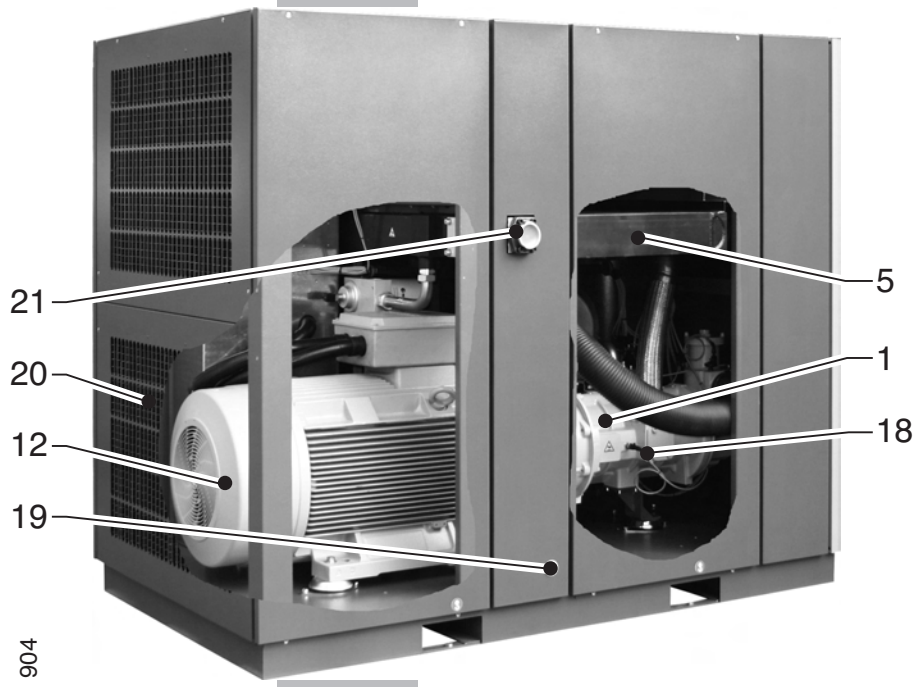
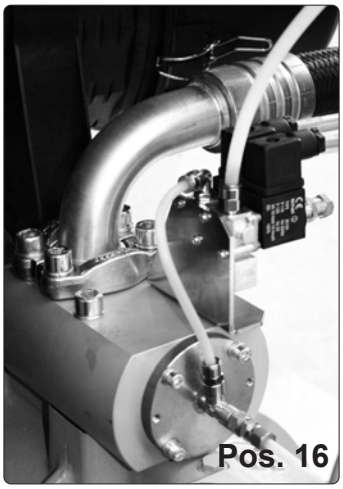


904

Position of main parts

1 - Compressor
2 - Intake filter
3 - Electric starter
4 - Oil cooler
5 - Air cooler
6 - Oil drain
7 - Receiver/Final oil separator
8 - Oil filler plug
9 - MAESTRO^{XS}
10 - Oil filter
11 - Oil level switch
12 - Main motor
13 - Fan
14 - Minimum pressure valve
15 - Oil return valve
16 - Oil stop valve
17 - Oil temperature feeler
18 - Compressor temperature feeler
19 - Electricity supply
20 - Pre-filter
21 - Air delivery
22 - Safety valve
23 - Thermostatic valve



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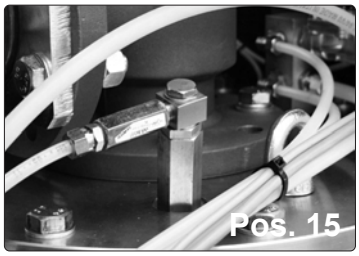

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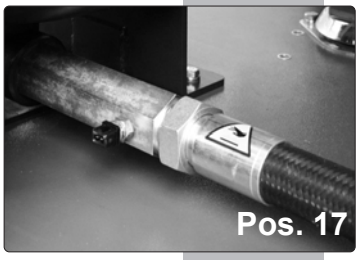

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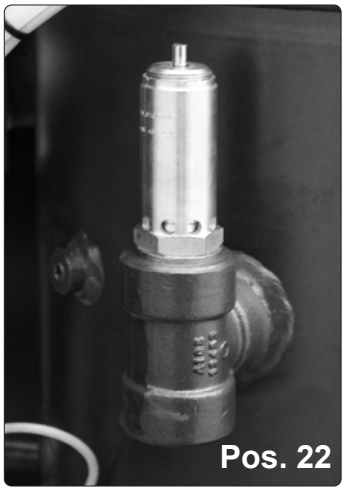

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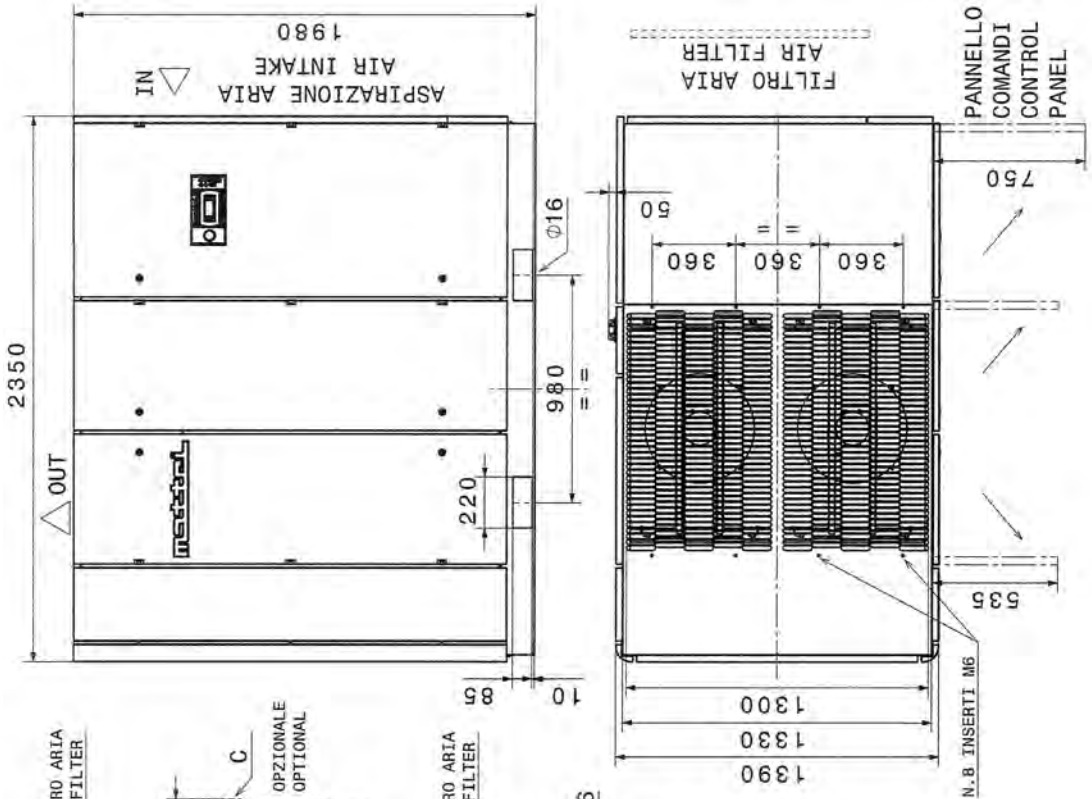
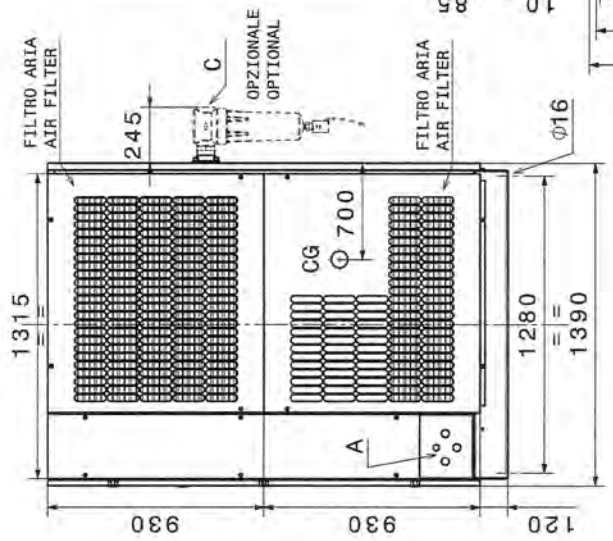
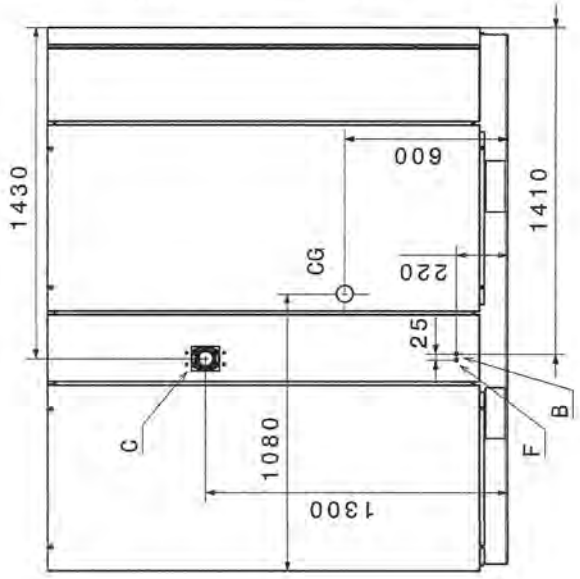
Technical Data and Overall Dimensions







ITEM	CONNECTION	SIZE	MODELLI	Massa Kg (con olio) Mass Kg (with oil)
A	INGRESSO LINEA EL. SUPPLY	N.3+1 Pressa CAVI	AC110L - H	2400
			AC110HH	2300
B	FORO SUPPLEMENTARE SUPPLEMENTARY HOLE	Φ15	AC132L - H - HH	2690
			OPTIMA 110	2490
C	USCITA ARIA AIR OUTLET	Rp 2-1/2"	OPTIMA 132	2780
C1	USCITA ARIA ESSICCATORE DRAIER AIR OUTLET			
D	ENTRATA ACQUA WATER INLET		SUPERFICIE DI CARICO LOADING ARE M2	-0,37
E	USCITA ACQUA WATER OUTLET			
F	FORO SUPPLEMENTARE SUPPLEMENTARY HOLE	Φ10	CARICO SULLE FONDAZIONI FLOOR LOAD MAX N/cm2	-7
CG	CENTRO DI GRAVITA' CENTER OF GRAVITY			

003

098

The whole area for the machine handling, including the space between the parking area for transport means and the machine installing area should be identified and inspected beforehand, to find any possible "**DANGEROUS AREAS**".

Be careful when handling, lifting and transporting the machine, not to damage it and not to damage things or cause injuries to persons.

905a

For this purpose:

❏ Verify the total mass of the machine and use a forlift truck or an adequate lifting means. Specific pictrograms indicate the lifting points.

❏ The centre of gravity is near the coupling between motor and compressor; before lifting, check (lift the unit from the ground just slightly) that lifting points are correct and there is not risk of overturning.

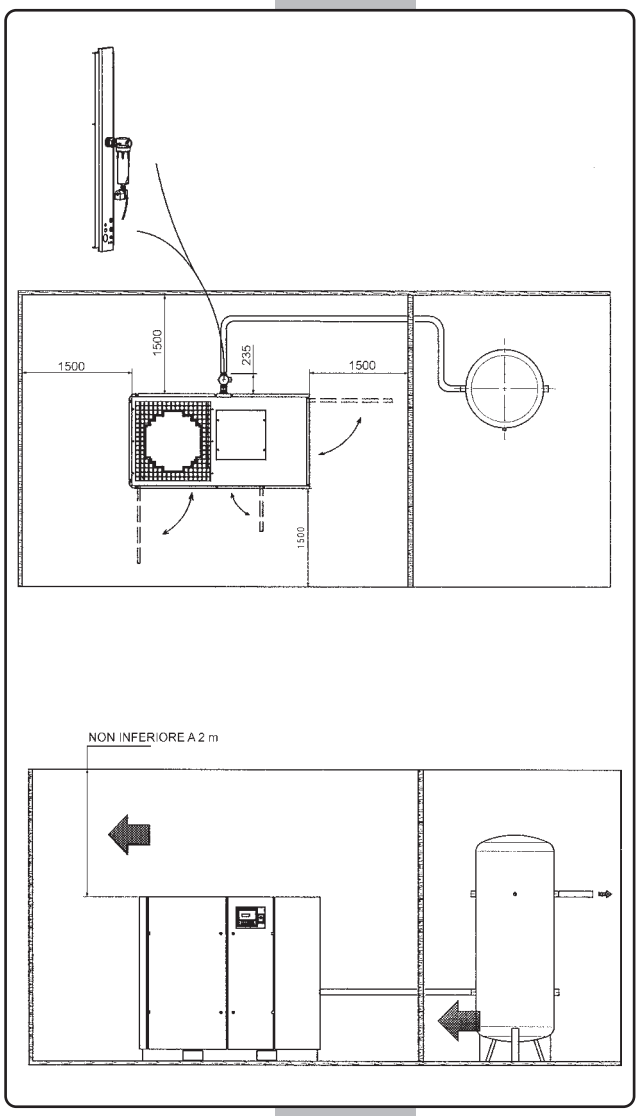
❏ When lifting, be careful not to damage the bearing structure (base) of the machine and the soundproof canopy.

906a

During the transport, carefully fix the machine to the means used, by blocking it lengthways and sideways.

It is recommended to protect the machine from atmospheric agents with suitable covering.

Unpack the machine by removing the guards and place it on the floor by means of a forklift truck to remove the pallet.



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Position of compressor

In the section “Technical Data ”you can find the overall dimensions, the weight,and the cooling values of the machine.
The compressor must be installed in a covered and well ventilated area ,away form heat sources.
It can be simply placed on a solid and level floor.
It does not require any type of special foundation.
Space and ventilation around the machine are essential.
An air-cooled compressor,driven by an electrical motor,produces heat equal to about 85% the absorbed power.
For the AC 6000 Series machines,having the cooling air outlet on the canopy top panel, the distance from the ceiling should not be lower than 1,5 meters.
If such a clearance is not possible, a hot air conveyor must be installed (see further on the section on ducts size and heat recovery).
The 1,5 meter distance, free from any obstructions, should be also kept on the intake end.
To make it easier to perform checks and maintenance operations on the compressor leave at least 1,5 m clearance from all other sides.

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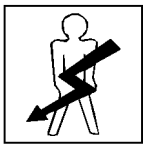


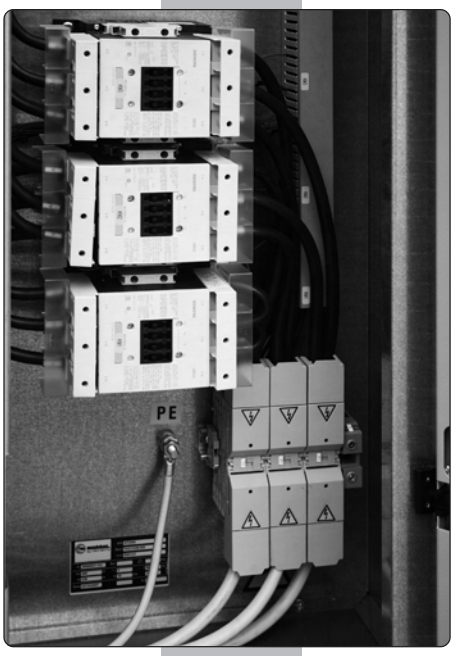
Electrical connection
Only qualified personnel should make the electrical connections, in compliance with current regulations.

098

WARNING !!!
For safe maintenance of all compressor components, including the electric starter, the customer should install a mains isolator and a magneto-thermal switch of suitable size as near as possible to the machine.

The mains isolator and magneto-thermal switch should be chosen by keeping into account the start features of the electric motor.
Adapting the size of wires between the mains isolator and the compressor starter should be made using the values given on the "**TECHNICAL DATA**" sheet.

920



All the machine auxiliary components are already connected to the start and control panel, and are powered through a transformer.

For further details, use the specific electrical diagram supplied with the machine.

WARNING !!!

098

Please note that the machine should be ALWAYS connected to the earth equipment.

900a

Connection to the air distribution system

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Compressed air distribution

Only qualified personnel should carry out the connection to the air distribution system, in compliance with the regulations in force.

The aim of distributing air is to bring compressed air from the machine to the end users, with the lowest pressure drop and energy waste.

To avoid losses and wastes, regularly check all pipings of the distribution equipment and all accessories.

Filters, regulators and other accessories should undergo proper maintenance.
The connecting pipe to the system should be flexible and with a diameter not lower than the pipe leaving the machine.

A detect valve is required to isolate the machine from the air distribution system in case of maintenance.

WARNING !
The machine is equipped with a NON RETURN VALVE; if the detect valve is closed when the air distribution is operating some air under pressure could remain inside the connecting pipe !
Arrange a draining system for the piece of piping between the compressor and the detect valve.

In case there is the need to disconnect the machine, ensure that the internal pressure is exhausted before the dismantling procedure.

Near the machine, derive a flexible hose from the distribution system and connect it to a blowing gun: it is needed for periodic cleaning of the radiator, the intake filter and all other machine components.

The air drawn in by compressors contains, in a variable quantity and depending on the ambient conditions, a certain quantity of water indicated as relative humidity.
After air has been compressed, it is cooled in a specific radiator, which all versions of the Mattei compressors are supplied with.
Cooling air produces condensate of a good quantity of the water it contains.
The condensate produced is separated and drained with an automatic device (optional).

Please note that condensate should be collected and eliminated in compliance with current laws.

Dimensions of compressed air distribution pipings

We mention that the main causes for wastes are pipings with unsuitable diameter and losses due to an improper setting up of the equipment or deteriorated materials.

The pipe diameter must be duly selected so as to minimize the pressure drop between the compressor or the storage receiver and the point of use, based on the machine features, like air delivery and working pressure.

The pressure drop is proportional to the pipe length and most losses occur during the change of direction (curves, elbows) and in the valves.

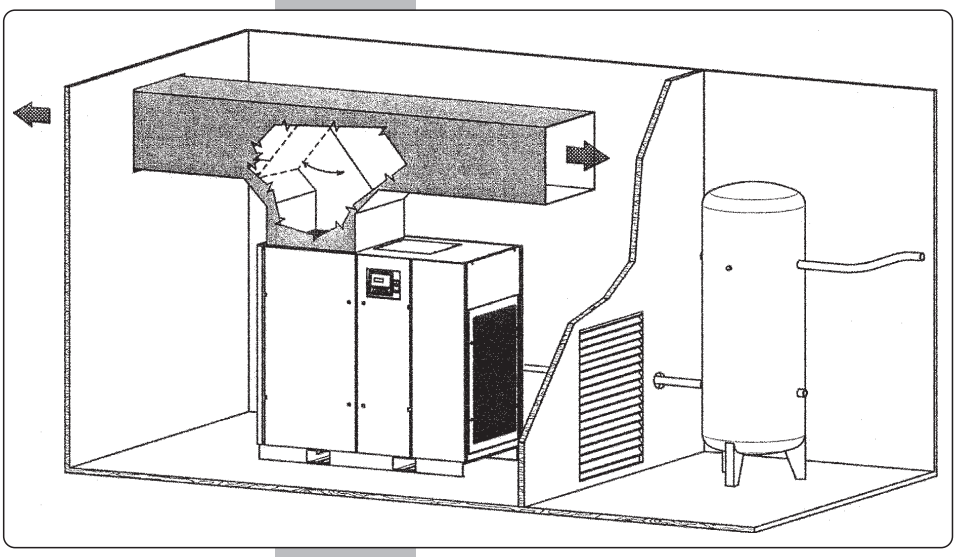
With a pipe having the same diameter as the compressor outlet, the length should not exceed 50 m.
To make a check of one's own equipment, "Table 1" gives the load losses, over 100 metres straight piping, according to nominal diameters usually employed and at different air delivery and working pressure conditions.

A perfect air distribution system should limit the pressure drop from compressor to the point of use within few tenths of bar.

Table 1 – Load losses (bar) over 100 m straight piping

Pipe Diameter	Free Air Delivery [m^3/min]	PRESSURE [bar]				
		6	7	8	9	10
1"	1	0,087	0,076	0,068	0,061	0,056
	2	0,315	0,275	0,245	0,220	0,200
	3	0,666	0,583	0,518	0,467	0,424
	4	1,134	0,993	0,883	0,795	0,722
2"	4	0,038	0,033	0,030	0,027	0,024
	8	0,138	0,120	0,107	0,096	0,088
	16	0,496	0,434	0,386	0,347	0,316
	24	1,050	0,919	0,817	0,735	0,669
3"	8	0,019	0,017	0,015	0,013	0,011
	16	0,069	0,060	0,054	0,048	0,044
	32	0,248	0,217	0,193	0,174	0,158
	64	0,894	0,783	0,696	0,626	0,570
4"	16	0,018	0,015	0,014	0,012	0,011
	32	0,064	0,056	0,050	0,045	0,041
	64	0,230	0,201	0,179	0,161	0,146
	128	0,829	0,725	0,645	0,580	0,528

Heat Recovery



278

As mentioned in the above section at Page 3.03, a fan produces an air flow that cools both the oil and the compressed air, heating up when it passes through the cooler.

The recoverable heat represents about 100% the installed power in the AC 6000 Series machines.

The heat produced can be conveniently recovered and used to heat rooms.

Any duct should be adequately sized and, if necessary, shaped in such a way to allow for a correct use during Winter and the output of hot air during Summer.

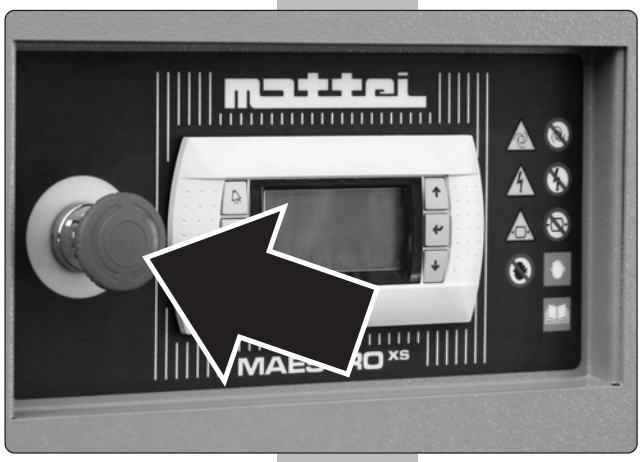
The duct to recover/output hot air should be designed by a competent engineer and should limit the load loss at approximately 20 Pa.

If the duct offers greater resistance, an auxiliary extractor should be used to prevent any overheating of the machine.

As an example, a duct with a higher or equal section to the coming out of the machine (the output grid on those versions equipped with a soundproof case), made up of some 10 m of straight duct and two 90 ° elbows properly connected, allows the maximum tolerated limits to be maintained.

However, it should be noted that 10 Pa increase corresponds to some 2 -3 °C increase in operating temperatures.
As for the recoverable heat, it should be noted that 1 kW of installed power allows for the heating up a volume of about 30 cubic meters by 1 K (1 kW =860 kcal/h).

In the Section on “TECHNICAL DATA ”attached to this manual the values required to realize that which is mentioned above are indicated.



921a

EMERGENCY - STOP button

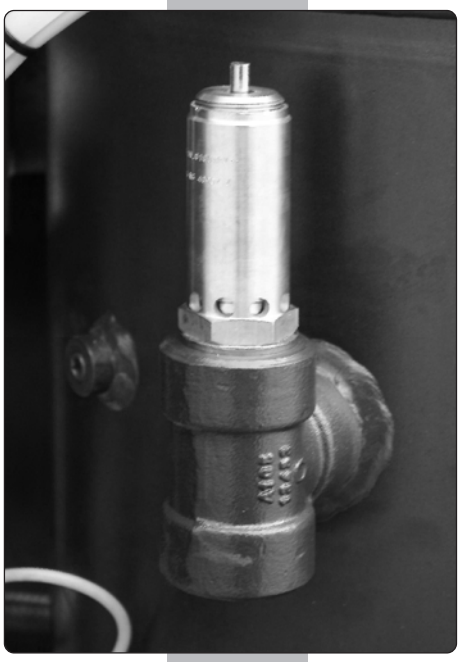
The machine stops immediately when the button is pressed.

098

This button is to be used also in an emergency situation.
Frequent stops of the compressor by means of this button **may damage its operation**.

WARNING

Please refer to the Manual of "**MAESTRO^{XS}**" Control attached to this Manual for detailed, description of keys, programming, and all of its functions.



918

Safety Valve

A “SAFETY VALVE ”protects the compressor in case of air overpressure inside the chamber,while limiting the value to its own setting limit.
The safety valve is set at 12 bar for L and H version of compressors and 15 bar for HH versions.

Operating pressure check

For compressors of the AC 6000 series the operating pressure is checked by MAESTRO^{XS}.
The maximum operating pressure is set during final inspection at its optimal value and DOES NOT require any further adjustments.

Setting Maximum Pressures

Version	L	H	HH
Maximum pressure	8 bar	10 bar	13 bar

103

Note

Compressor operation depends on the set values; it is suggested to ask for modification of settings only in case of real need and with knowledge.
Only skilled personnel should make the setting.

851

099

MAESTRO^{xs} is a programmable device to control the machine that can adapt its operation to the specific requirements of the network it is connected to.

It has several programming levels, with special possibilities of control/analysis of operation and of failures.
The advanced programming and analysis levels are protected by digital codes so as to prevent any unintentional tampering.
Maestro^{xs} has a storage that saves the settings made over time as well as the data on operation even if the machine is not connected to the electrical line or if voltage drops occur.
A weekly schedule of starts/stops can be set that is combined with the management of the connection to other machines so as to control any multiple installations as efficiently as possible.
“Maestro xs” is a control device made up of two separate units:

- Display with keypad
- Data input-output device

Keypad

The buttons are backlit for enhanced clarity and, in some cases, in order to complete the information provided by the device.

852

Reset buttons: Resets any faults detected by the system. Eliminate the reason for the fault first.

853

On / Off button: Enables and disables the compressor.

854

Esc button: Accesses the main menu and exits the current menu.

855

Up button: Moves around the various menus. Also increases the value of a variable in the edit mode.

856

Enter button: Accesses the selected menu and opens and closes the memory in the edit mode.

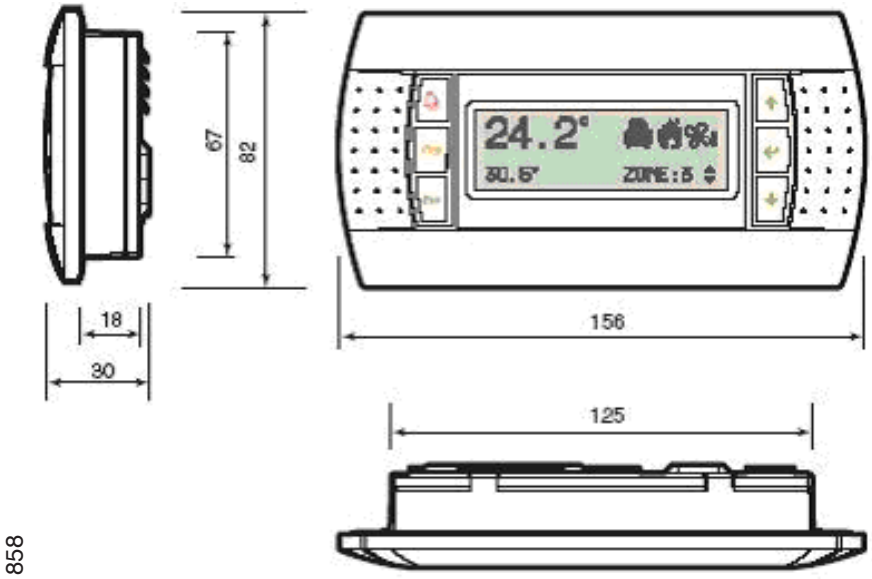
857

Down button: Moves around the various menus. Also decreases the value of a variable in the edit mode.

Technical specifications

Display		FSTN graphic
	Backlighting	Light-blue LED's
	Resolution	132 x 64 pixel
Keypad	Material	Silicon rubber
	Number of buttons	6
	Backlit buttons	Yes
Power input	Voltage	From basic module via phone cable
Operating conditions	Temperature	-20 / +60°C
	Humidity	90% R.H.

Overall dimensions



858

900

Foreword

The user should appoint a qualified person for operation and maintenance of the machine.

He should properly train all operators, so that they are acquainted with all needed measures to prevent any accident or injury to people.

All start and stop procedures as well as emergency ones should be known; they should be also periodically checked with the operators.

The operating and maintenance manual should be always available; in case of loss or damage, further copies can be purchased from Mattei's sales organisation.

Checks before start

Before starting the machine, ensure that:

- ❑ the electrical system complies with voltage and power of the machine and that wires are of suitable section;
- ❑ the machine is earth connected and protected against possible short circuits;
- ❑ the mains isolator is installed near the machine;
- ❑ the machine oil level is correct. When the machine is still and without pressure in the chamber, the oil level should be between the MIN and MAX levels shown on the indicator. If the level is insufficient, fill it up with suitable oil and of the same type as the one used;
- ❑ the machine is connected to the compressed air system.

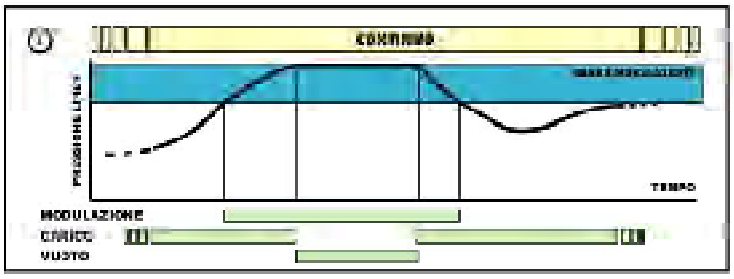
Operation Modes

To meet the users' requirements, Mattei compressors have been designed to work in three main operating modes: Continuous, Automatic and Modulation.
(modulation not available for compressors of the AC 6000 series)
The factory-preset mode is AUTOMATIC. To change the setting please refer to page 6.04 of MAESTRO^{XS} 1.1.03 operating manual.

An overview of these three options is given below.

Continuous (Cont)

072

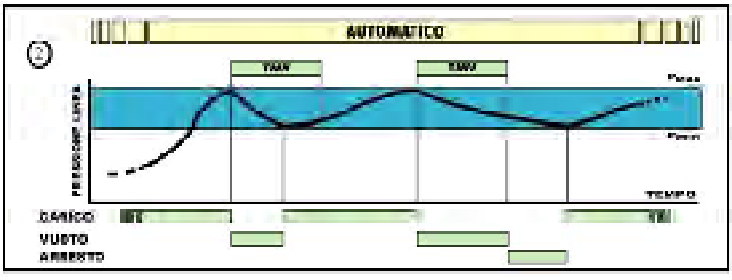


In this mode, the compressor delivers air within a clearly defined pressure range; maximum and minimum values are factory-set by Mattei though they can be customised using the programming functions in the [User] menu. When pressure reaches the maximum value (Pmax) the compressor is off-loaded (suction valve closed) and decompressed in order to reduce power consumption. As soon as a request for air from the network reduces pressure to the minimum value (Pmin) the compressor loads again and resumes air delivery. The compressor can be stopped at any time by pressing the stop button: the stopping procedure comprises a no-load run phase which lasts for a set time during which the compressor is decompressed.

Nota
If the unit is enabled with a line pressure greater than the set minimum pressure, the compressor does not start but waits for the pressure to fall below the minimum value.

Automatic (Auto) (**Preset** Mode)

073



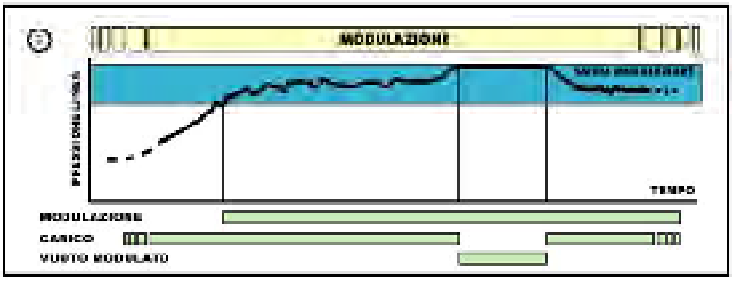
This mode adds another function to the previous one: the compressor can automatically stop at low or no air demand conditions. The cycle is the following. When line pressure reaches Pmax, the compressor is "off-loaded"; at this point, two things can happen:
1. if there is no demand for air it runs no-load for a certain period of time TMV (No-load Run Time) and stops when this period of time expires; it starts again as soon as line pressure falls below Pmin;
2. if line pressure falls to Pmin before TMV expires, the compressor is "recharged".

The above operating mode can be combined with a special characteristic of MATTEI rotary compressors, the MODULATION phase.

By suitably adjusting the its “servo-valve”, the compressor can modulate before reaching Pmax. This means that Pmax can only be reached in case of very low or nil demand.

Nota
If the unit is enabled with a line pressure greater than the set minimum pressure, the compressor does not start but waits for the pressure to fall below the minimum value.

Modulation (not available for compressors of the AC 6000 series)



074

All MATTEI compressors are fitted with an automatic system for adjusting pressure according to delivery pressure. The internal pressure of the compressor depends (partly) on line pressure and, consequently, on the demand for air; when the latter drops or is nil, line pressure and internal pressure increase. In Mattei compressors, the maximum pressure at which the unit runs no-load can be set (by calibrating a valve). For values slightly below maximum, the suction valve is only “partially” closed by suitably modulating machine capacity to line requirements. Maximum pressure and values slightly below this define a field or range which is known as a MODULATION BAND.
This operating mode exploits this potential. The control unit ignores the Pmax and Pmin. settings and operates the compressor without stopping except in case of an operator command.

Nota
The modulation bandwidth is typically 0.3 bar.

Suppose maximum no-load pressure is set (using the SERVO-VALVE) to 7.3 bar.

- For pressure values lower than 7 bar (7.3 - 0.3 = 7), the compressor delivers 100% of its capacity.
- For values ranging from 7 to 7.3 bar (the modulation band), the compressor delivers less than its rated capacity, suitable for line demand.

099

Upon delivery, the compressor is protected by an alphanumerical code which must be provided by Mattei and entered the first time it is switched on.
The compressor will not work if this code is not entered because, as soon as the compressor is powered, the screen shown appears with the cursor flashing in the top left-hand corner.

859

ENTERING THE CODE

Press < ↵ > to move the cursor to the first digit of the code to enter.
Press <↓> and <↑> to select the letters or numbers to enter and confirm with < ↵ >.
The cursor automatically moves on to the next position after each digit is confirmed and, if the code has been correctly entered, the first page of the menu appears [MONITOR].
If the code is entered incorrectly, instead, MAESTRO xs asks for the entire code to be re-entered.

ⓘ After being entered correctly, the code will no longer be requested.
From now on, the compressor can be used and configured.

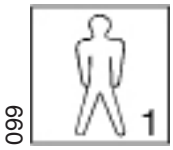
In order to communicate with the user, MAESTRO^{xs} features carious menus that allow the compressor to be monitored and programmed. These are divided by function and not all of them can be accessed by the final customer. Some of them are protected by one or more passwords.
The menus are divided according to the functions that they control.
The main menus used to manage the compressor are:

Menu	User access	Password	Menu ID
Monitor Menu	Yes	No	0
User Menu	Yes	No	1
Advanced Menu	No	Yes	2
Clock Menu	Yes	No	3
Log Menu	Yes	No	4
Network Menu	Yes	No	5
Info Menu	Yes	No	6

To simplify use of the compressor, some symbols are used to graphically represent certain functions, such as machine status and other settings.
Other symbols are used to report operating problems, special enabled functions, etc..
The various menus also use texts informing the user of the meaning of the variables and the functions they perform.
To simplify traceability of a variable, every menu is identified by a number, as shown in table 3. The same applies to the submenus and individual variables.

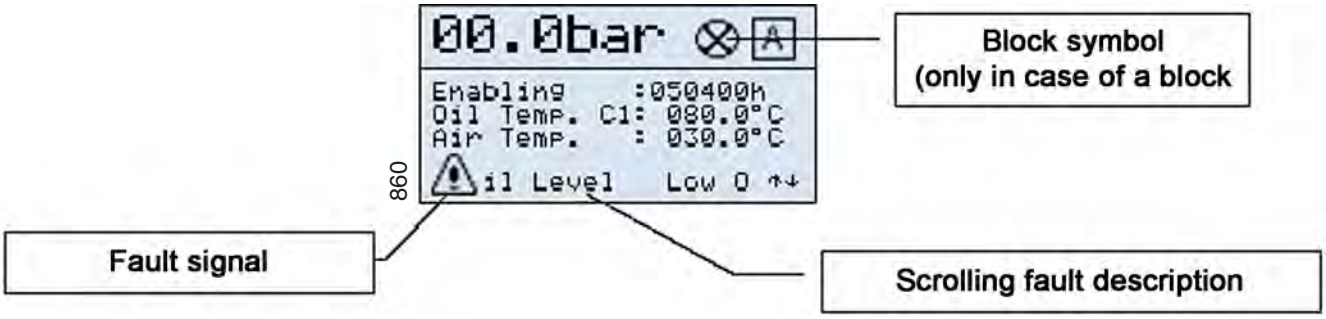
For a more detailed description of individual menus, please refer to the Maestro xs manual (code TE-CA2G-007) supplied with this manual.

Operational Failures

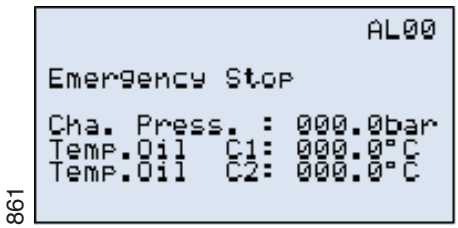


Failures can be divided as follows:
- ❑ Failures with an intervention signal (alarms)
- ❑ Failures causing the immediate stop of the compressor (blocks).

The card signals a failure by lighting of the reset button, together with a visual signal through icons and a sliding description.

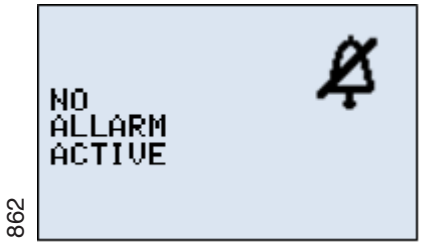


Press the “reset” key once, for more information about the kind of failure occured. A page appears that contains the information on the failure and specifically:



- ❑ The event code
- ❑ The working time at which the failure occurred
- ❑ The detailed description of failure to the main compressor (C1)
- ❑ The detailed description of failure to the additional compressor (C 2) when fitted
- ❑ The chamber pressure at the moment of failure

All these information are stored in the incorporated historical archive together with other information, and it is possible to store up to 20 failures
When the failure number exceeds the allowed limit, the system clears the least recent failure to insert the latest one.
Press ““**Reset**” key a second time to reset the compressor operation.



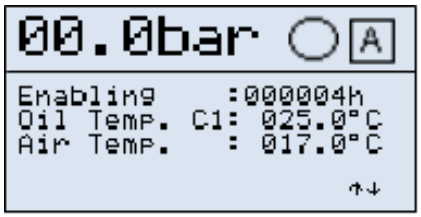
Note : for Plus versions the faults “frost alarm” and “high dewpoint” are visually signalled when the dewpoint temperature is out of the standard operating range, with automatic restoring as soon as the temperature goes back to the normal values.
See MAESTRO xs manual (code TECA2G-007) supplied together with this manual.

WARNING !!!
If the failure cause cannot be solved, the compressor will not start as the failure appears to be still active and re-displays the intervention request.

WARNING !!!
The rotation in the wrong direction can seriously damage the compressor.

099

Once all foreseen operations before starting have been performed, and which have been described in the Sections above, the Maestro page displayed to the operator is :



863

Starting
Press the key to switch the compressor “on”


853

The led lights with yellow colour.

The compressor is started. It starts off load (intake valve closed) and then goes on load after a pre-set time, subsequent to the star-delta switching delay

The compressor, from this moment on, delivers compressed air according to the set operation mode.

After starting, the page below appears within few seconds

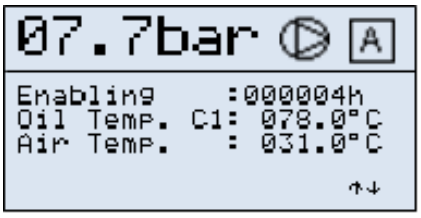
864

Stop
To stop the compressor, press key


853

The yellow led of the ON key turns off.

The display shows:

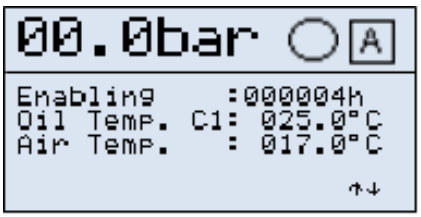


865

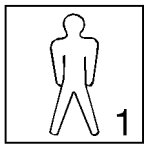
The compressor is unloaded (decompressed) for a preset time (basic programming).

After the motor has stopped the residual pressure inside the compressor discharges completely in approximately one minute.

The display will show the following page



866

660 

The machine can be restarted according to the above sequence, but it will start again only if the internal pressure has lowered under the maximum allowed value for the re-start (preset factory data not changeable by the user)

NOTE
MAESTRO^{XS} has a control logic that prevents an excessive number of consecutives starts.

This logic is cleared by the user 's manual intervention, if he/she acts directly by turning off and on the machine manually.

WARNING

660 

An excessive number of consecutive starts may damage the main motor.
Operate manually only in case of real need and wait for a reasonable amount of time before restarting the machine.

The number of starts depends now on many parameters,the rated power,the operation cycle,the working pressure,and the ambient temperature.

For any requirement,please contact MATTEI.

Suggestions on maintenance

Machine cleaning

Cleaning of the equipment should be carried out at regular intervals, following the schedule in this manual.
To clean delicate parts of the machine direct the compressed air jet so that neither machining waste nor humidity can penetrate in the mechanic assemblies.
Only use lint-free cloths to clean internal and/or moving parts (in contact with lubricant).
Always use perfectlly dry air during the cleaning and at suitable pressure to avoid injuries to the operator.

Maintenance schedule

The time intervals in the maintenance tables are only reference values concerning the machine operation at the company's conditions.
Environment factors affecting these intervals are mainly: machine environment (temperature, humidity) and air pollution.

Machine lubrication

Use only the lubricant quantity needed to lubricate the involved mechanism. Carefully dry the excess oil or grease with a cloth.
Sometimes an excess or a lack of lubricant may jeopardize the machine operation.
Only recommended lubricants or well known and tested equivalent lubricants should be used for lubrication
Replacement of the exhausted oils should be made when the machine is warm. The oil temperature should range between 25 and 30 °C. (see section 8).
The draining and filling holes should not be left open for more than the time needed to replace the oil.

Jobs to be performed during maintenance

During maintenance operations pay attention to all signs that may precede a failure, and specifically:
- presence of corrosion,
- presence of wear,
- presence of loose unions or connections,
- presence of oxidized contacts,
- after each maintenance operation, exhaust the air from the pneumatic pipings.

Minimizing downtimes after a failure

It should be noted that correctly performed maintenance interventions may minimize downtimes after a failure.
A repair made in due time prevents further deterioration.
Only use original spare parts and repair the damaged component thoroughly, by your factory or send it to the nearest authorised service centre.

098 

Regular Checks
WARNING !!!

102 

After the first 50 hours of operation and every 6 months or 1000 hours:
- tighten nuts and screws fixing the cables in the command and control electrical board and in the terminal board of electrical motors.

101 

Within the first 300 hours of operation:
- clean the oil return valves (Page 7.05).

Weekly (or every 50 hours)
- Check the oil level
- Check and Clean the condensate drain solenoid valve filter (with optional kit).

Monthly (or every 200 hours)
- Clean the intake filter.
- Clean the oil cooler and the compressed air after cooler.
- Clean the pre-filter of the suction grids

Every three months (or every 500 hours)
- Clean the oil return valves

Every 6 months (or every 1.000 hours)
- Replace the intake filter
- Tighten nuts and screws fixing the wires inside the start and control panel and inside the motor terminal board.
- Grease the motor bearings

Yearly (or every 2.000 hours)
- Replace the oil return valves

Oil change
Rotoroil 8000 F2:
- every 12 months or 5.000 hours
Rotoroil 8000 F4:
- every 12 months or 5.000 hours
Rotoroil 8000 FG:
- every 12 months or 1.000 hours

Replace the oil filter at every oil change.

098 

WARNING !!!
In dusty environments and/or at high temperatures maintenance operations should be carried out more frequently.
The manufacturing date is quoted on rubber hoses.
Their operating life is 3 years, after which they should be replaced.

WARNING !!!

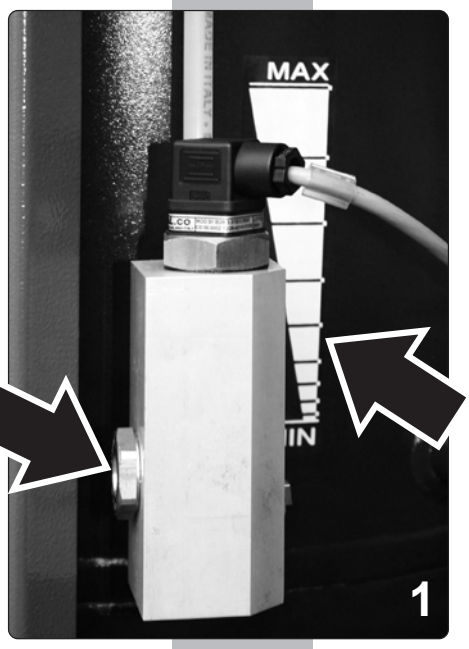
098 

Scheduled maintenance agreements are available, to help the user keeping the machines at best operating and efficiency conditions.

Please apply to **Ing. ENEA MATTEI S.p.A. / M.T.A.** for further details.

098 

WARNING !!!
For compressors equipped with INVERTER, before performing any maintenance job, wait at least 5 minutes after you have disconnected the electricity supply.



924

101

Check of oil level (Photo 1)

With compressor not operating and without pressure inside the chamber the oil level should be included between the MIN and MAX levels shown on the specific indicating sticker (fig. 1).
When the compressor is running and on load, the oil level should be over the visual indicator half (fig. 1).

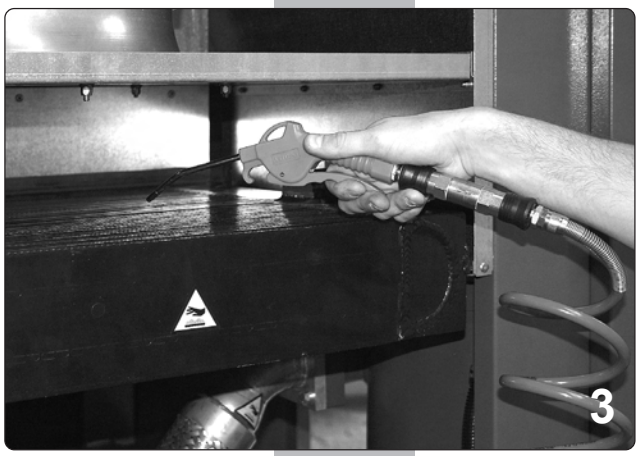
Cleaning/replacing the air intake filter
(Photo 2)
Release the fixing hooks to remove the filter cover. Firstly take out the outer element, then the inner element by using the specific knob. Clean with compressed air, directing the air jet from the inside to the outside. Reassemble in the reverse order.

Cleaning the oil/air radiator (Photo 3)
Considering the air flow used to wash the compressor, the radiator is crossed by an air flow directed from downwards to upwards.

Therefore the dust deposits mainly on the bottom. To clean the oil radiator, remove the fan guard panel (photo 4) and blow the radiator with a compressed air flow.

618

To clean the air end, remove the soundproof panel and proceed as above, by blowing the radiator by means of a compressed air flow.



222

223

225

101

Cleaning the prefilters

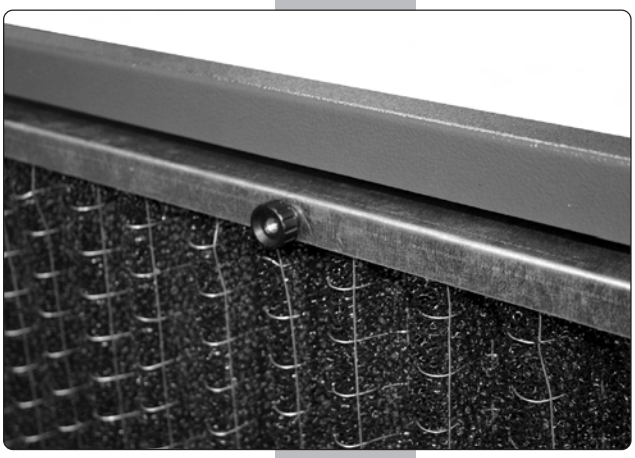
The machine is equipped with a prefilter to remove dust and is articulated by the intake air.

The prefilter is composed of a metal frame containing a filtering wire mesh.

It slides on metal guides in the side panel and should be removed from its housing for replacement or cleaning purposes.

It filters the intake air and washes the compressor while preventing foreign particles from entering the machine.

Frequent cleaning of panels is essential.
To do this, open the door through the fixing lock,take out the panel and blow out with compressed air.

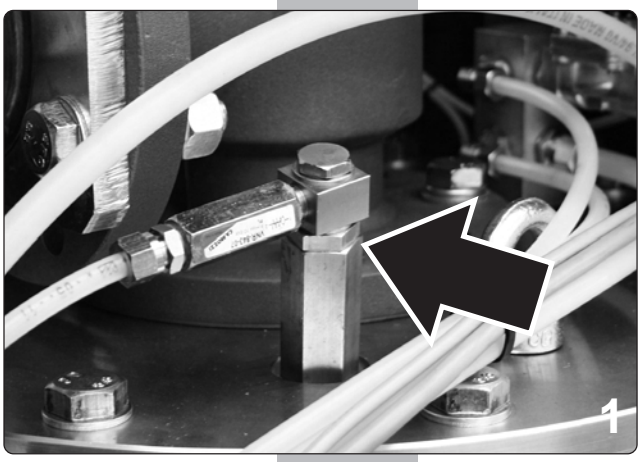


224

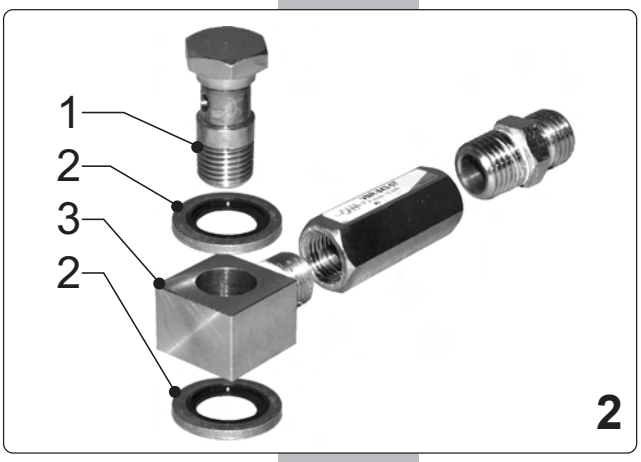
The synthetic material can be washed whenever necessary.

No solvents should be used for the washing.

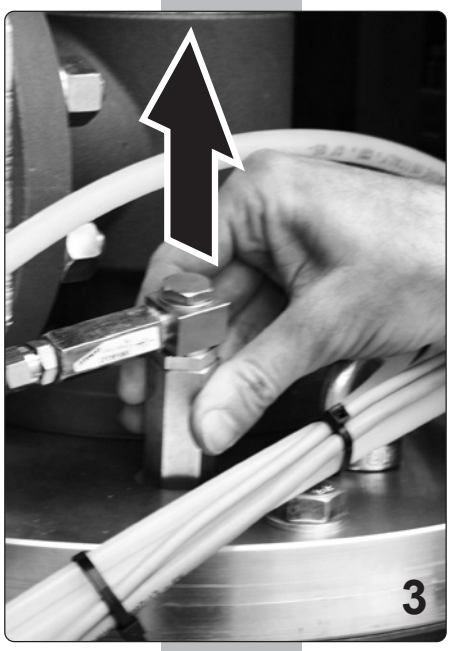
925



229



926



101

Cleaning and/or replacing the oil return valves (Photo 1)

Proceed as follows :
- unscrew the screw (Photo 2 - Pos. 1);
- remove the connection (Photo 2 - Pos. 3) and the gaskets (Photo 2 - Pos. 2);
- unscrew the filter (Photo 4 - Pos. 4) from its seat (Photo 4 - Pos. 6);
  wash the valve with detergent and blow with compressed air; replace the sintered filter if it is fouled.

Always check the integrity of the O ring (Photo 4 - Pos. 5) for the assembly and replace it, if necessary.

Replace it (Photo 4 - Pos. 5) always when changing the oil.

Repeat the operation at every 500 hours of operation.

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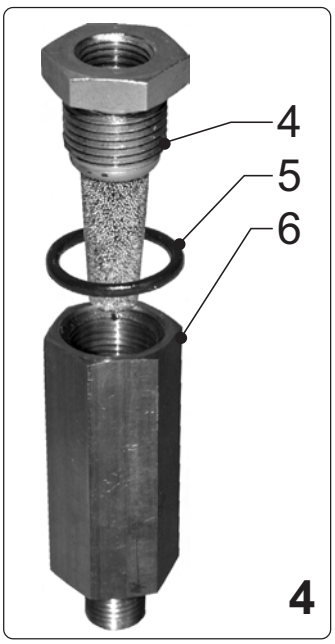

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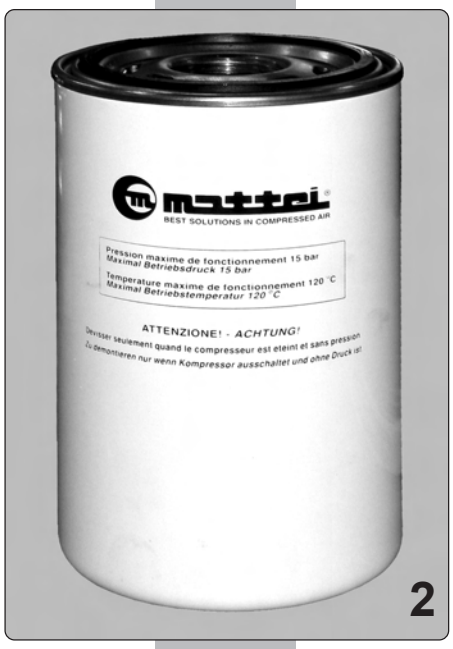

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101

Replacing of the oil filter

Replace the oil filter every time you change the oil.

Do not discharge the oil from the machine to replace the filter.
Just wait for a few seconds after the last stop to enable the oil in the tubes to flow.

Proceed as follows:
- unscrew the filter cartridge (Photo 1)
- clean the seat;
- wet the gasket of the new cartridge with oil and screw it (Photo 2).

Cleaning and replacement of bush filter (Photo 3)

Proceed as follows:
- unscrew the filter cartridge (Photo 3)
- clean the seat;
- wet the gasket of the new cartridge with oil and screw it.

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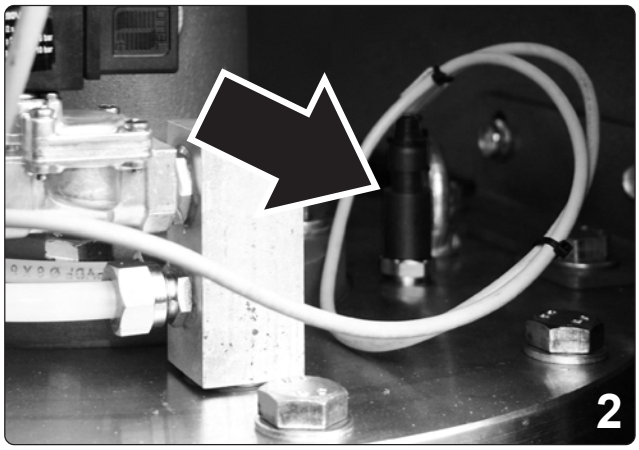

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Replacing the air-oil separator elements (Photo 1)

1 - Remove the side panels of the soundproof canopy to gain access to the separator.
2 - Disconnect the separator pressure probe (Photo 2).
3 - Remove the ORV as shown in section “ORV Cleaning and Replacement”.
4 - Detach the pressure exhaust solenoid valve and the feeding pipes of the oil stop valve, the load setting valve and the vacuum relief valve (Photo 3).
5 - Dismantle the small squares fixing the separator to the canopy panel (Photo 4).
6 - Remove the minimum pressure valve body:
- unscrew the 4 screws fixing the head to the separator cover (Photo 5).
- To remove the body extract the air delivery pipe from the radiator housing (Photo 6).

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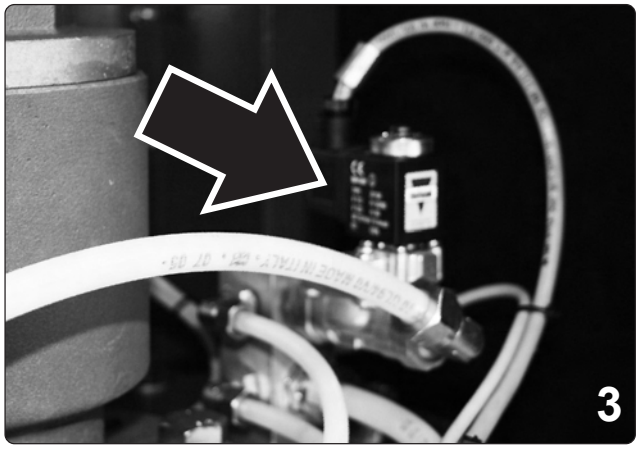

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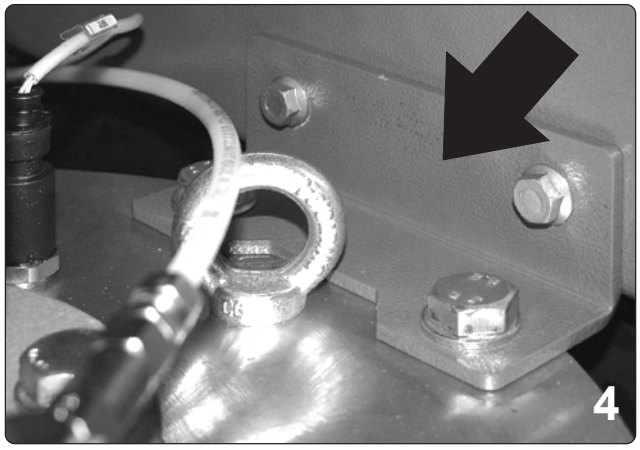

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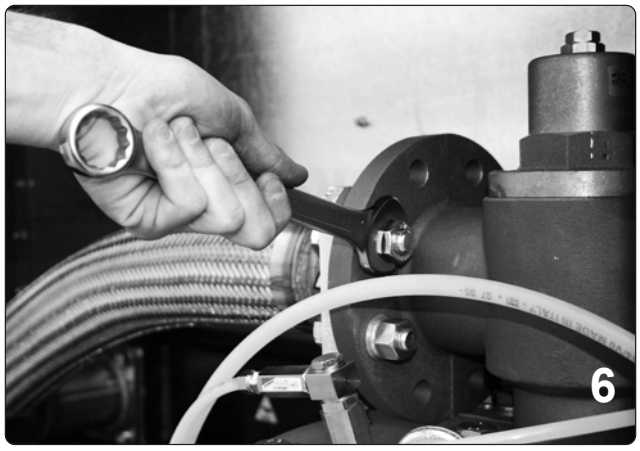

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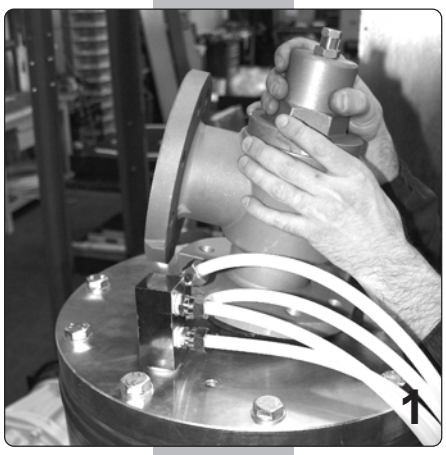

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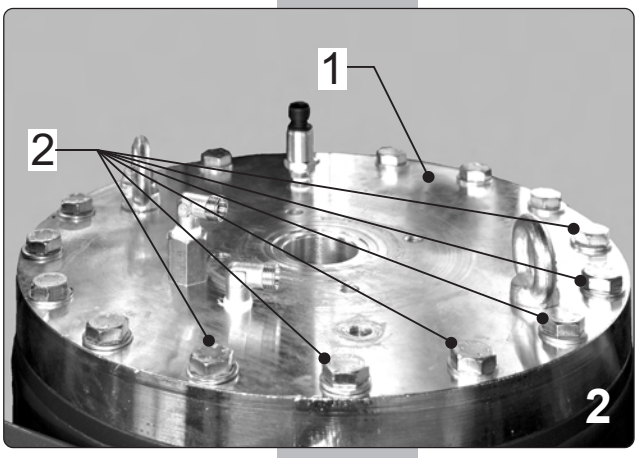

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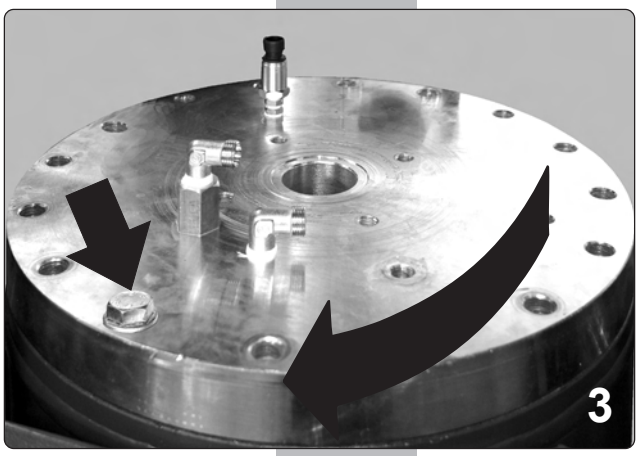

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Replacing the air-oil separator elements

7 - Unscrew the fixing screws (Photo 2 - Pos. 2) of the cover (Photo 2 - Pos. 1).

8 - Remove the fixing screws except one that will act as the cover rotation pin.

9 - Rotate the cover as shown in Photo 3 while avoiding any damage to the o-ring. (Photo 4)

10 - Unscrew the spark plugs (Photo 5) and withdraw them from the separator.

11 - Replace the spark plugs (Photo 6).

Act in the reverse order for the assembling, while verifying the condition of the o-ring.
Note: Carefully tighten the cover screws with a 20 Kgm torque.

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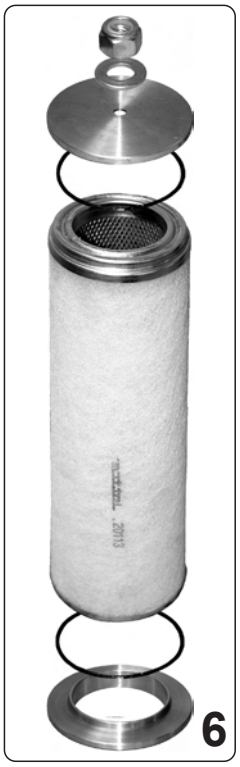

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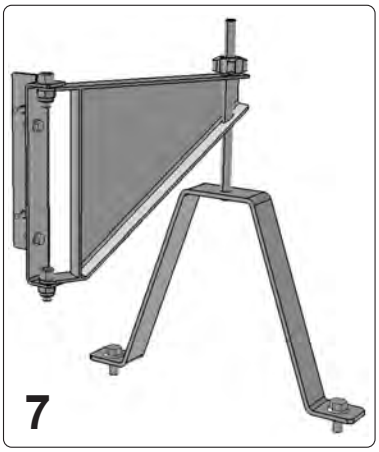

ATTENTION

The tool shown in Photo 7 allows for an easier removal of the cover.

Please contact **MTA** for ordering the tool.

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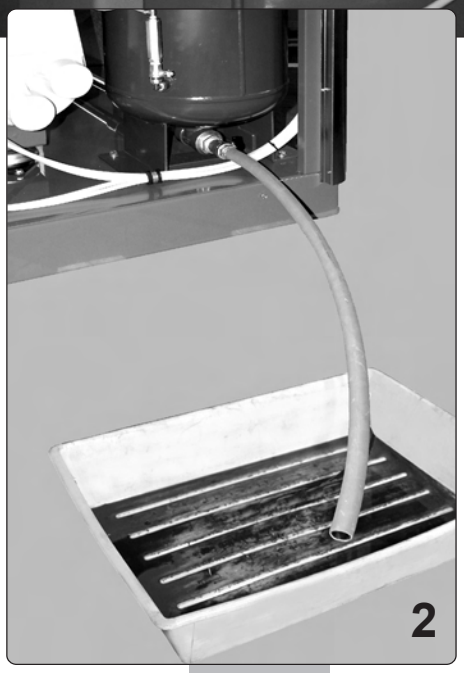

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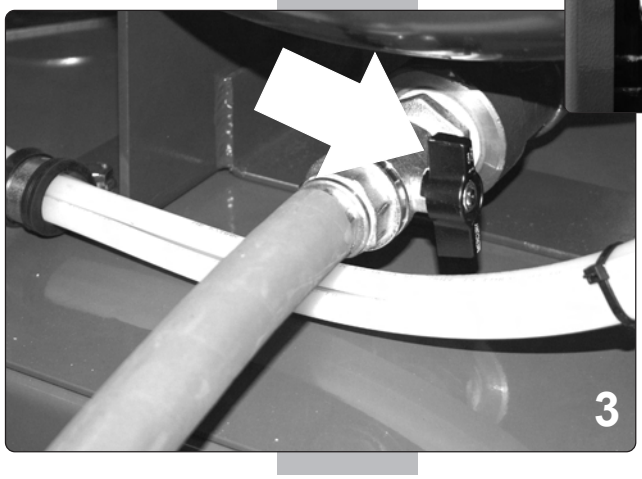

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Foreword

As mentioned before, the oil performs many essential functions for compressor operation and, consequently, it is important to check its quantity and conditions at the suggested times.

Please refer to the specific tables to choose the most suitable oil types for the different operating conditions.

First oil change

If not differently stated in the nameplate, the compressor is supplied with Rotoroil 8000 F2 oil.

The first oil change and the first oil filter change should take place within 5000 hours or one year.

It should be noted that exhausted oil is dangerous for operation of the compressor and, therefore, it should be replaced when the change interval has expired.

The oil should be replaced with the machine not operating and with warm oil.

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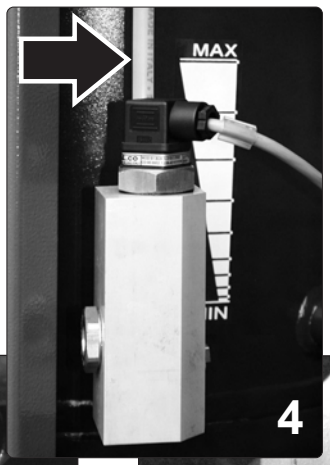

To drain the oil, wait until the compressor is no more pressurized, checking that the pressure gauge on the separator or on the receiver indicates there is no more internal pressure.

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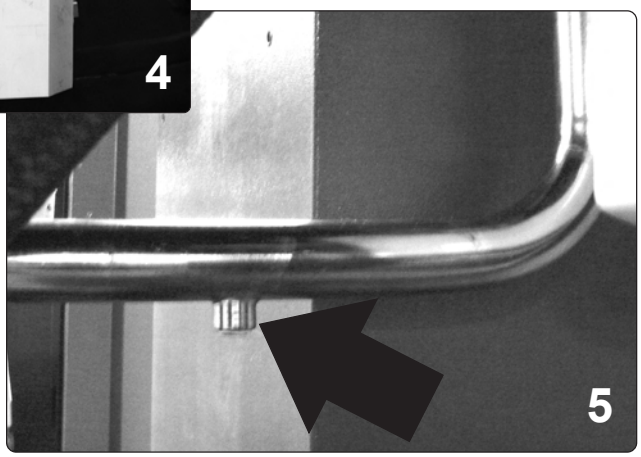

Slowly unscrew the filling hole plug (Photo 1) and check if there is any foam; wait for some minutes until the oil demulsifies.

Open the drain plug (Photo 2) and drain the oil into a suitable container.

Close the drain plug.

Fill the oil chamber with new oil until reaching the MAX level (fig. 4).

Replace the plug gasket and tighten it well.

Start the compressor and let it operate for few minutes, then stop it and verify the correct level by means of the specific indicating sticker (fig. 4). Top up if necessary.

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Use of Rotoroil lubricants

It is recommended to use Mattei Rotoroil 8000lubricants.
Successive oil changes can be made at the scheduled intervals.

If the machine has already operated for a long period with other lubricants and there are traces of sludge or deposits, it is suggested to wash with Rotoroil 8000 F2/F4 for about 200 hours, so as to remove all residual impurities.

It is also recommended, when filling up with new oil, to replace the oil filter and the separator filtering elements.

Lubricants are flammable products.

Observe the indications given on the containers !

During the disposal of exhausted lubricants it is necessary to comply with following environment protection rules:

• Lubricants may contaminate water and soil !
Never pour lubricants on the ground, into water, or in the sewerage system.
Any infringement of these rules can be legally prosecuted! When handling lubricants keep an oil agglomerative base near the working area.
• Recover the exhausted lubricants while separating the mineral based from synthetic lubricants. Upon disposal, please comply with current regulations concerning the disposal of exhausted oils.

Only the use of lubricants with suitable quality guarantees a safe operation of the machine.

It is forbidden to mix lubricants of a different quality, as their composition and additives are not the same.

This rule should be mainly applied to synthetic and mineral lubricant mixtures.

If other lubricants are to be used, it should be verified beforehand if the two products are compatible.
In case of doubts, the lubricant used up to that moment should be completely eliminated, by means of a washing procedure of the fluid circuit.
To avoid any risk of contamination, the lubrication procedures should be carried out under “absolute cleanliness” conditions.
All manufacturers of lubricants mentioned in the table offer a technical information service that may answer all your questions on lubrication.

WARNING on lubricants

The correct use of suitable lubricants considerably helps to obtain the maximum performance and the elimination of failures.
During the handling of lubricants on equipments, it is essential to strictly comply with the following precautions, for sanitary protection:

- Avoid any prolonged, excessive or repeated contact of the skin with lubricating products as well as avoid inhalation of their vapours or fumes.
- Wear suitable clothing and protections to protect the skin (for instance overalls, eyeglasses or, as far as allowed by the safety rules, protection gloves) or apply a protective product.
- Clean dirty skin carefully by abundantly washing it with water and soap.
- Apply a skin cream after washing.
- Take out and change clothes and shoes soaked with oil.
- Never put oil soaked cloths in one’s pockets.

General

Several oils are available on the market and research continuously improves their characteristics and it changes the names and specifications.
When the warranty period is over, during which the use of Mattei Rotoroil lubricant is compulsory, the user can decide to use the oil he believes most suitable or the available one, provided it is suitable for rotary vane compressors.
Only manufacturers of lubricants can recommend the most suitable oil for the kind of machine and for its specific application.
The user should then purchase the lubricant from an oil company or a distributor that guarantees its suitability for the specific use.
The cost of the best lubricant is a small percentage of the total running cost of the machine: it is suggested to purchase the best available on the market (see the section "**MATTEI LUBRICANTS**").
Please consider that in lubricated and injection cooled compressors the oil performs the listed tasks and it is subject to continuous working cycles; therefore, it should be highly resistant to oxidation to ensure long life.
The oil should also provide a good demulsivity.
Anti-oxidizing additives should provide low volatile substances at the compressor operating temperatures, so as to ensure protection between one oil filling and the other.
The user must adopt the kind of oil grade recommended by Mattei.
Please refer to the specific table for the choice, according to the operating conditions.

Available oils on the market

There are several kinds of oils on the market, including:
- ❑ mineral based industrial oils;
- ❑ synthetic oils.

Mineral based industrial oils

These oils have been designed for different applications and also for some types of compressors.
In this case, too, there are standards specifying their features; please refer to DIN 51506 which classifies the oils as VB-L, VC-L e VD-L, according to their possibility of working at different temperatures.
The latter is suitable for high temperatures and it is resistant to oxidation caused by the continuous mixing with the air.
ISO 6743-3A classifies oils based on the operating temperature and pressure and, according to this rule, for rotary vane compressors ISO-L-DAH o DAJ oils are recommended, which are for medium and heavy applications.
The table indicates some typical values of the main characteristics."

Typical featuress of Industrial Oils	**Measuring unit**	**Ambient temperature 5 ÷ 40**	**Ambient temperature -5 ÷ 30**
Viscosity ISO VG	---	150	100
Viscosity at 40°	cSt	135 ÷ 165	90 ÷ 105
Viscosity at 100°	cSt	14 ÷ 16	10 ÷ 12
Viscosity Index		93 ÷ 100	100 ÷ 110
Pour point	°C	-10 ÷ -5	-15 ÷ -10
Flash point V.A.	°C	230 ÷ 265	250 ÷ 265
Mass density	Kg/m^3	940 ÷ 960	940 ÷ 960

Values in the Table are merely indicative

Synthetic oils

Many synthetic oils with different basis are available on the market (esters, glycols, etc) that sometimes have proved to be suitable and provide a longer life than mineral oils.
Normally they reduce carbon deposits, provide a high self-ignition temperature and are remarkably resistant to oxidation.
As synthetic lubricants are good detergents, to change the kind of lubricant in a machine and pass from a conventional mineral based to a synthetic one, it is necessary to carry out a thorough washing, following the supplier's instructions, to avoid damages to the machine if dirt, residues and deposits circulate.
It is also necessary to pay attention to condensate, as usually synthetic lubricants are more sensitive to water washing and their thin film may not provide enough protection against rust.
This problem can be worsened if the compressor is not working continuously, but occasionally.
In this case, even though not suggesting its use, any responsibility for the choice is up to the user and to the lubricant supplier.

WARNING !!!
It is difficult to determine life of an oil, as there are different parameters affecting the same, among which the operating temperature and quality of the intake air are very important.
For this reason it is recommended to obtain precise guarantees from the supplier, validated by the analysis of samples taken from the machine, to determine the suitability of lubricant and its life.

MATTEI LUBRICANTS

Considering the important role of lubricant for operation of the compressor, Mattei offers special lubricants to the users and recommends their use.

These are:

- Mattei Rotoroil 8000 F2 (synthetic),
- Mattei Rotoroil 8000 F4 (synthetic),
- Mattei Rotoroil 8000 FG (synthetic, non toxic)

available in 2, 5 and 25 litres cans.

Their life can reach the hours shown in the table, depending on the operating temperature and conditions of the intake air.

MATTEI LUBRICANTS

Name (~~max.~~)	Ambient temperature	Operating hours
Rotoroil 8000 F2	From - 15° a + 45 °C	5000
Rotoroil 8000 F4	From - 30° a + 30 °C	5000
Rotoroil 8000 FG	From - 5° a + 40 °C	1000

Safety Precautions

There is a latent risk of fire in almost all compressed air systems and ISO 5388 Standard explains the reasons.
In fact, in compressed air systems both oxygen and oil are always present and are combustible.
Should for any reason oil vapours form, these could burn in presence of a flame; an ignition source may start a fire in case of use of excessive or unsuitable oil, or when neglecting maintenance.
Faulty maintenance has been mentioned, because a dirty radiator may cause a temperature rise, often quickly, which leads to oil damage and to the creation of deposits.
Such processes are accelerated if unsuitable oil is used.
Based on experience, fires are almost never caused by the fact that the oil self-ignition temperature is reached (340-400 °C).
Usually the cause is that the oil, while decomposing, creates carbon residues that when in contact with air and high temperature, continue to oxidize and, under special conditions, may ignite. So it is essential to use suitable lubricants and carry out correct maintenance.

098 860

WARNING !!!

It is opportune that to prevent the risk of fires the best attention is given to the oil choice and to execution of all maintenance operations, and specifically:

- carry out regular and complete oil changes;
- ascertain that the coolling system is always efficient, with often checks to the oil temperature;
- verify that protecting devices installed are always in perfect working order;
- keep the oil consumption under control;
- take care of the machine cleaning.

Storage and treatment of oils

Usually lubricant containers are built so as to prevent any contamination.
When the user receives the lubricant, it is under his responsibility to avoid damages or pollution to the same.

The lubricant may get damaged due to:

- dust and dirt;
- condensate, mainly due to absorbing humidity from the air;
- extreme temperatures;
- mixing with other oil types.

Please note that dirt in the oil reduces its efficiency and causes wear of those parts it comes into contact with, therefore there is the need to increase maintenance.
Instead, condensate cancels the effect of some additives, often present in very limited quantities.
Oil containers should be stored in protected rooms, avoiding exposure to extreme temperatures.

098 860

WARNING !!!

**Absolutely avoid the mixing of oils of a different grade and quality .
Although looking alike, they could not be compatible.
Also beware of oil leaks, not only being a waste, but also polluting, causing falls or injuries to people and also fires.**

General

As mentioned in the section dedicated to protections, the command and control board controls the smooth operation of the compressor. It is possible that, due to the incorrect use of the machine, or incorrect maintenance or unforeseen conditions, etc., malfunctions occur and that
only their effects are indicated. The table below aims at helping the operator solve some difficulties should they arise while indicating their possible causes.

Problem - Cause - Solution

Below some possible failures are indicated with their causes and how to identify the correct solution.

PROBLEM	CAUSE	SOLUTION
A. Start MAESTRO^{XS} works, start is allowed but the star/triangle commutation does not take function correctly	The electrical supply is not sufficient and the excessive voltage drop during the starting causes release of the contactor.	Check correct sizing of the electrical supply. Please refer to section 4 of the supply. Contact the nearest authorised service centre.
MAESTRO^{XS} works, it enables the start by turning green LED on, but the compressor does not start.	Pressure inside the compressor is higher than the maximum tolerated value for the start: or for an abnormal return of the network air, or because the pressure transducer reads an incorrect value.	Check the inner pressure on the pressure gauge of the separator body and compare it with the value given by MAESTRO^{XS}. Verify the correct operation of the pressure detection system: transducer, collector and switching solenoid valves. Contact the nearest authorized service center.
	The hour programming has been enabled.	
	The compressor runs within a network with other compressors.	
B. Pressure The system pressure does not reach the required value.	The load setting valve is not working properly.	Check operation. Please contact the nearest service center.
	The condensate drain solenoid valve is blocked in the open position (Optional kit separator/condensate drain).	Clean the specific filter to remove the cause of the block and then check operation. Please refer to the “Installation, Use, and Maintenance Manual”, Section 12.
	The minimum pressure valve does not function correctly.	Check operation. Contact the nearest authorized service center.
	Clogged intake filter.	Replace the filter. Refer to section 7 to the “Operating and maintenance manual ”.
	Request for air greater than the compressor maximum capacity.	Please refer to the Sales Organization of Ing. Enea Mattei S.p.A. to study equipment improvement..
The inside pressure exceeds the set value .	The setting of the maximum pressure value in the [BASIC PROGRAM.] menu is incorrect.	Verify the correct setting of operating parameters. Please refer to the "Installation Use, and Maintenance Manual", Sections 5 and 6.

PROBLEM	CAUSE	SOLUTION
C. Oil Excessive oil consumption; the oil the level lowers too quickly; clogged; oil is detected inside the system.	The oil return valve filters are clogged.	Replace filters and verify the causes of the clogging. (see Section 7)
D. Temperature The compressor stops due to its own over-heating.	The radiator or the cooling air filter are Dirty the ambient temperature is too hight for compressor operation.	Replace the filters and verify the causes of clogging. (see section 7)
The compressor stops due to the over-heating of the motor.	Excessive working pressure.	Verify the setting and re-set to the value foreseen for the machine. (see Section 7)
	The motor cooling is not sufficient; There is not enough air or it is too hot.	Verify the environmental conditions and the condition of the filtering panel. (see Sections 3 and 7)

General

The electric motor characteristics are given on the nameplate fixed to the motor itself, and specifically:

1. Model
2. Serial number
3. Protection degree
4. Insulation class
5. Maximum ambient temperature
6. Service
7. Service factor
8. Supply voltage [V]
9. Frequency [Hz]
10. Speed [rpm1]
11. Power [kW]
12. Power factor [cos _]
13. Rated intensity [A]
14. Motor weight
15. Type of bearings (front and rear)

Lubrication

The same plate also indicates the type of bearings mounted, for which it is recommended to use lithium based grease for lubrication.
Greasing (where necessary) should be carried out when the motor is running.
The lubrication intervals should never be longer than the solar year.

Cooling

The motor is equipped with a cover and fan, to guarantee proper cooling. Check that dirt does not form on this cover as it could reduce the cooling air passage.

Abnormal noises

Any vibration or abnormal noise is usually due to deterioration of the bearings. In this case it is recommended to replace the bearings rather than risking more serious problems to the motor or the machine.

Electrical checks

If the machine has been stored for a long period or in case of long stops in damp places, it is suggested to measure the winding insulation value by applying 500 V d.c. voltage for 60 seconds.
The insulation should be at least 10 MΩ (MegaOhms) in warm conditions or 100 MΩ in cold conditions.
Should these values not be detected and in case the motor has been exposed to damp, it is suggested to dry it for 24 hours in a furnace at 100-110 °C.
If no furnaces are available, please contact the manufacturer.

WARNING !!!
Before starting the machine, verify that the nuts locking the terminals of the power supply wires are well tightened.

Storage

The compressor is protected against corrosion and deterioration for the shipment period and for a relatively short period of storage (3 months).
For longer periods please contact the manufacturer considering it can be maximum time 24 months.
In any case it is suitable to keep the machine in a dry place, protected against atmospheric agents.
In wet climates, to protect the electrical and mechanic components the machine should be kept in a heated room or closed in a barrier- bag with heaters or light bulbs.
Specifically for the motor, please refer to what mentioned about the winding insulation.

Decommissioning

Decommissioning the machine does not involve any special precautions, only collection of the oil contained in the machine and components of the lubrication system, like the oil filter and the oil-air separators.

WARNING !!!

Both these elements and the oil should be collected and dumped in compliance with the current regulations on the environment in order to avoid any pollution and danger of fire.

Dismantling

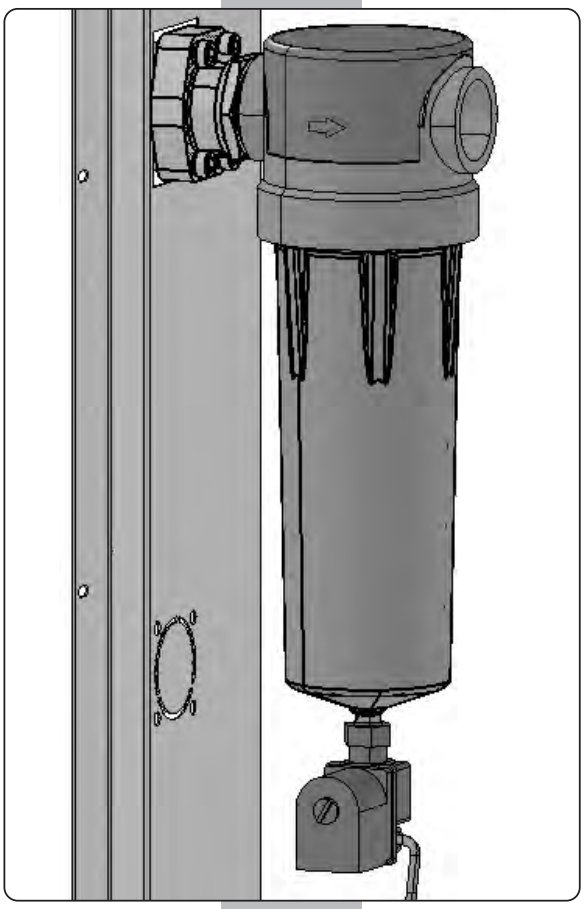
When the machine has reached the end of its technical and operating life, it can be demolished, i.e. decommissioned and put in such a condition so as not to be used any longer for the purposes it was designed and built, with the possible recycling of raw materials.

NOTE
Ing. ENEA MATTEI S.p.A. will not take any responsibility for damage to people or objects that may derive from the recycling of individual components of the machine, for operation or assembling situations different that the original ones.
Ing. ENEA MATTEI S.p.A. refuses any implicit or explicit acknowledgement of suitability to specific purposes of the machine components re-used after the final dismantling in view of its demolition.

WARNING
The deactivation and dismantling of the machine should be carried out only by duly trained and equipped staff.

Act as follows to deactivate the machine permanently:
- ❍ Drain the oil from the receiver.
- ❍ Disconnect the machine from the electrical and pneumatic supply systems.
- ❍ Lift the machine with suitable lifting means.
- ❍ Disassemble the machine main components.
- ❍ Block all the machine moving parts.
- ❍ Take all the machine components in supervised dumps.

Residual risks after deactivation
After deactivating the machine, there are no residual risk if all moving parts have been duly blocked.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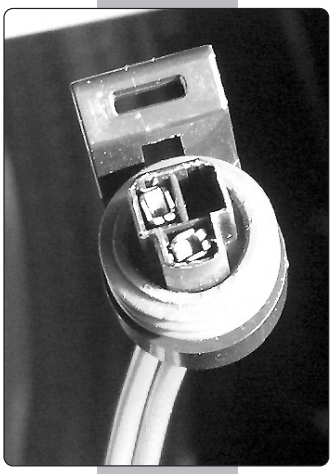
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101

Cleaning the drain solenoid valve filter

Unscrew the connection and remove the drain solenoid valve.
Withdraw the solenoid valve filter using beak pliers, remove any dirt and wash with detergent.
Re-assemble in the reverse order while paying special attention to the position of the solenoid valve seal.

023

Form to request Technical Service

M.T.A. S.P.A. MECCANICA TECNICA ASSISTENZA
Corso Italia, 47 – 24049 VERDELLO - ZINGONIA (Bergamo) - Italy
TEL: +39 - 035/4186400 (Ric.Aut.) FAX: +39 - 035/4186490
e-mail: info@mta.bg.it
C.P. N° 69 Zingonia

Company _____

Address _____

Please note our request for intervention for our machine:

Modell _____ Serial Number _____

Intervention to be carried out at :

Contact Person _____

Telephone _____

Failure	**Description**
Electrical	_____
	_____
	_____
	_____
	_____
	_____
Mechanical	_____
	_____
	_____
	_____
	_____
	_____

Notes _____

_____

_____

Place _____ Date _____

Stamp and Signature

Form to request spare parts

M.T.A. S.P.A. MECCANICA TECNICA ASSISTENZA
Corso Italia, 47 – 24049 VERDELLO - ZINGONIA (Bergamo) - Italy
TEL: +39 - 035/4186400 (Ric.Aut.) FAX: +39 - 035/4186490
e-mail: info@mta.bg.it
C.P. N° 69 Zingonia

Company _____

Address _____

Please note our order no. _____ of _____ with required delivery on _____ for our machine :

Model _____ Serial Number _____

Reference	Description	Quantity

Notes _____

Place _____ Date _____

Stamp and Signature

Parts to be replaced during maintenance

DESCRIPTION	CODE	COMPONENTS	QUANTITY
Maintenance Kit	IF57A24268	Air filter	1
		Oil return valve filter	2
		O-ring	2
		O-ring	1
		Oil filter huile	1
		Element	1
Separator air kit	IF57A23884	O-ring	2
		O-ring	1
		O-ring	16
		Element	8
		O-ring	1
Prefilter	C052042336		2

Lubrificanti Mattei ROTOROIL 8000

COMPONENT	CODE	DESCRIPTION	QUANTITAY
Oil F2	BCL06FC002	Can	2 liters
	BCL06FC005	Can	5 liters
	BCL06FC025	Can	25 liters
Oil F4	BCL06SC002	Can	2 liters
	BCL06SC005	Can	5 liters
	BCL06SC025	Can	25 liters
Oil FG	BCL06AC002	Can	2 liters
	BCL06AC005	Can	5 liters
	BCL06AC025	Can	25 liters
Grease for motor bearings	M00566	Cartridge	___

mattei® BEST SOLUTIONS IN COMPRESSED AIR	DESIGN DATA **SERIE 6000** *SCHEDA TECNICA*		

TYPE / TIPO			**AC 110**		
VERSION / *VERSIONE*			**L**	**H**	**HH**
Air end nominal pressure [bar(g)] *Pressione nom. unità di compressione*			7,5	9,5	12,5
PERFORMANCES / *PRESTAZIONI*					
		bar (g)			
Air delivery / *Portata effettiva*	**[l/min]**	5	21990	-	-
Terminal power / *Potenza ai morsetti* (2)	**[kW]**		118,5	-	-
	[l/min]	6	21645	-	-
	[kW]		128,8	-	-
	[l/min]	7	21440	17975	-
	[kW]		138,8	117,2	-
	[l/min]	**7,5 (1)**	**21350**	17900	-
	[kW]		**143,6**	121,2	-
	[l/min]	8	-	17830	-
	[kW]		-	125,2	-
	[l/min]	9	-	17705	16470
	[kW]		-	132,5	119,3
	[l/min]	**9,5**	-	**17650**	16415
	[kW]		-	**135,8**	122,3
	[l/min]	10	-	-	16370
	[kW]		-	-	125,1
	[l/min]	11	-	-	16280
	[kW]		-	-	130,1
	[l/min]	12	-	-	16230
	[kW]		-	-	133,9
	[l/min]	**12,5**	-	-	**16200**
	[kW]		-	-	**135,1**
Off load power / *Potenza assorbita a vuoto*		[kW]	37,3	32,6	29,7
Sound pressure level **(3) (6)** / *Livello pressione acustica* **(3) (6)**		[dB(A)]		69	
REFERENCE CONDITION / *CONDIZIONI DI RIFERIMENTO*					
Intake pressure / *Pressione d'aspirazione*		[bar(a)]		1	
Intake temperature / *Temperatura aspirazione*		[°C]		20	
Relative humidity / *Umidità relativa*		%		0	
Nominal motor speed / *Velocità nominale motore*		[g/1']		1500	
ELECTRICAL CHARACTERISTICS / *CARATTERISTICHE ELETTRICHE*					
Motor rated power / *Potenza nominale motore*		[kW]		110	
Voltage **(4)** - Frequency / *Tensione* **(4)** - *Frequenza*		[V/Hz]		400/50	
Enclosure-Insulation class / *Grado prot.-Classe isolamento*				IP55-F	
Electric starting / *Tipo avviamento*				Stella triangolo / *Star delta*	
Fan rated power **(6)** / *Potenza assorbita vent.* **(6)**		[kW]		3,5	
Auxiliary circuit voltage / *Tensione circuito ausiliario*		[V]		110	
Supply min wire section / *Sez. min cavo alimentazione*		[mm2]		120 (x 10 m)	
TYPE OF REGULATION / *TIPO DI REGOLAZIONE*					
Modulation / *Modulazione*				-	
On load, off load and stop / *Marcia a carico, a vuoto e arresto*				controllo pressostatico / pressureswitch	
On load, off load / *Marcia a carico, a vuoto*				controllo pressostatico / pressureswitch	
DRYER / *ESSICCATORE* (Only Plus / *Solo Plus*)					
Absorbed power / *Potenza assorbita*		[kW]		-	
Gas				R 404 A	
Nominal dew point / *Punto di rugiada nominale*		[°C]		3	
OTHERS / *VARIE*					
Allowable ambient temperature / *Temp. Amb. min-max*		[°C]		+1 / +40	
Outlet air temperature **(5)** / *Temperatura uscita aria* **(5)**					
AC		[°C]		≤ 30	
min-max oil temperature / *Temperatura min e max olio*		[°C]		80÷110	
Cooling air flow rate **(6)** / *Portata aria di raffreddamento* **(6)**		[m3/h]		20500	
Fan residual head **(6)** / *Prevalenza residua ventilatore* **(6)**		[Pa]		200	
Total recoverable heat / *Calore totale recuperabile*		%		~ 95	
Oil system capacity / *Capacità circuito olio*		[l]		60	
Oil carry over / *Residuo olio nell'aria compressa*		[ppm]		≤ 3	
Air outlet size / *Attacco uscita aria*				Rp 2 ½"	
with condensate sep. KIT **(7)** / *con KIT separ. condensa* **(7)**				*	
Condensate drain outlet size / *Attacco scarico di condensa*					
plus version / *versione plus*				*	
with condensate sep. KIT **(7)** / *con KIT separ. condensa* **(7)**				ϕ 10	
Water inlet-outlet size / *Attacco ingresso-uscita acqua*					
With heat recovery kit **(7)** / *con KIT recupero calore* **(7)**				*	
LxWxH / LxLxA		[mm]		2350 x 1390 x 1980	
Weight with oil / *Peso con olio*		[kg]	2400	2400	2300

(1)= According to ISO 1217: 1996 (annex "C") / *Secondo ISO 1217: 1996 (annesso "C")*

(2)= Whitout dryer power (only Plus version) / *Esclusa potenza essiccatore (versioni Plus)*

(3)= According to PN8NTC2.3 measured at 1m distance / *Secondo PN8NTC2.3 misurato alla distanza di 1m*

(4)= According to IEC 38 / *Secondo IEC 38*

(5)= According to reference conditions indicated / *Alle condizioni di riferimento indicate*

(6)= Frequency 50 Hz / *Frequenza 50 Hz*

(7)= Optional / *Opzionale*

mattei® BEST SOLUTIONS IN COMPRESSED AIR		DESIGN DATA **SERIE 6000** *SCHEDA TECNICA*			
TYPE / TIPO			**AC 132**		
VERSION / *VERSIONE*			**L**	**H**	**HH**
Air end nominal pressure [bar(g)] *Pressione nom. unità di compressione*			7,5	9,5	12,5
PERFORMANCES / *PRESTAZIONI*					
		bar (g)			
Air delivery / *Portata effettiva*	**[l/min]**	5	25160	-	-
Terminal power / *Potenza ai morsetti* (2)	**[kW]**		138,4	-	-
	[l/min]	6	24790	-	-
	[kW]		150,4	-	-
	[l/min]	7	24565	22360	-
	[kW]		162,2	157,8	-
	[l/min]	**7,5 (1)**	**24470**	22270	-
	[kW]		**167,7**	163,2	-
	[l/min]	8	-	22180	-
	[kW]		-	168,6	-
	[l/min]	9	-	22020	21290
	[kW]		-	163,4	147,2
	[l/min]	**9,5**	-	**21950**	21225
	[kW]		-	**167,4**	150,9
	[l/min]	10	-	-	21165
	[kW]		-	-	154,4
	[l/min]	11	-	-	21050
	[kW]		-	-	160,5
	[l/min]	12	-	-	20985
	[kW]		-	-	165,2
	[l/min]	**12,5**	-	-	**18650**
	[kW]		-	-	**163,6**
Off load power / *Potenza assorbita a vuoto*		[kW]	43,6	38,8	34,4
Sound pressure level **(3) (6)** / *Livello pressione acustica* **(3) (6)**		[dB(A)]		69	
REFERENCE CONDITION / *CONDIZIONI DI RIFERIMENTO*					
Intake pressure / *Pressione d'aspirazione*		[bar(a)]		1	
Intake temperature / *Temperatura aspirazione*		[°C]		20	
Relative humidity / *Umidità relativa*		%		0	
Nominal motor speed / *Velocità nominale motore*		[g/1']		1500	
ELECTRICAL CHARACTERISTICS / *CARATTERISTICHE ELETTRICHE*					
Motor rated power / *Potenza nominale motore*		[kW]		132	
Voltage **(4)** - Frequency / *Tensione* **(4)** - *Frequenza*		[V/Hz]		400/50	
Enclosure-Insulation class / *Grado prot.-Classe isolamento*				IP55-F	
Electric starting / *Tipo avviamento*				Stella triangolo / *Star delta*	
Fan rated power **(6)** / *Potenza assorbita vent.* **(6)**		[kW]		3,5	
Auxiliary circuit voltage / *Tensione circuito ausiliario*		[V]		110	
Supply min wire section / *Sez. min cavo alimentazione*		[mm2]		120 (x 10 m)	
TYPE OF REGULATION / *TIPO DI REGOLAZIONE*					
Modulation / *Modulazione*				-	
On load, off load and stop / *Marcia a carico, a vuoto e arresto*				controllo pressostatico / pressureswitch	
On load, off load / *Marcia a carico, a vuoto*				controllo pressostatico / pressureswitch	
DRYER / *ESSICCATORE* (Only Plus / *Solo Plus*)					
Absorbed power / *Potenza assorbita*		[kW]		-	
Gas				R 404 A	
Nominal dew point / *Punto di rugiada nominale*		[°C]		3	
OTHERS / *VARIE*					
Allowable ambient temperature / *Temp. Amb. min-max*		[°C]		+1 / +40	
Outlet air temperature **(5)** / *Temperatura uscita aria* **(5)**					
AC		[°C]		≤ 30	
min-max oil temperature / *Temperatura min e max olio*		[°C]		80÷110	
Cooling air flow rate **(6)** / *Portata aria di raffreddamento* **(6)**		[m3/h]		17500	
Fan residual head **(6)** / *Prevalenza residua ventilatore* **(6)**		[Pa]		180	
Total recoverable heat / *Calore totale recuperabile*		%		~ 95	
Oil system capacity / *Capacità circuito olio*		[l]		60	
Oil carry over / *Residuo olio nell'aria compressa*		[ppm]		≤ 3	
Air outlet size / *Attacco uscita aria*				Rp 2 ½"	
with condensate sep. KIT **(7)** / *con KIT separ. condensa* **(7)**				*	
Condensate drain outlet size / *Attacco scarico di condensa*					
plus version / *versione plus*				*	
with condensate sep. KIT **(7)** / *con KIT separ. condensa* **(7)**				ϕ 10	
Water inlet-outlet size / *Attacco ingresso-uscita acqua*					
With heat recovery kit **(7)** / *con KIT recupero calore* **(7)**				*	
LxWxH / LxLxA		[mm]		2350 x 1390 x 1980	
Weight with oil / *Peso con olio*		[kg]		2690	

(1)= According to ISO 1217: 1996 (annex "C") / *Secondo ISO 1217: 1996 (annesso "C")*

(2)= Whitout dryer power (only Plus version) / *Esclusa potenza essiccatore (versioni Plus)*

(3)= According to PN8NTC2.3 measured at 1m distance / *Secondo PN8NTC2.3 misurato alla distanza di 1m*

(4)= According to IEC 38 / *Secondo IEC 38*

(5)= According to reference conditions indicated / *Alle condizioni di riferimento indicate*

(6)= Frequency 50 Hz / *Frequenza 50 Hz*

(7)= Optional / *Opzionale*