

SERIES  
**ENERGY SAVING**

ROTARY VANE COMPRESSORS

OPTIMA  
MAXIMA



# SERIES ENERGY SAVING

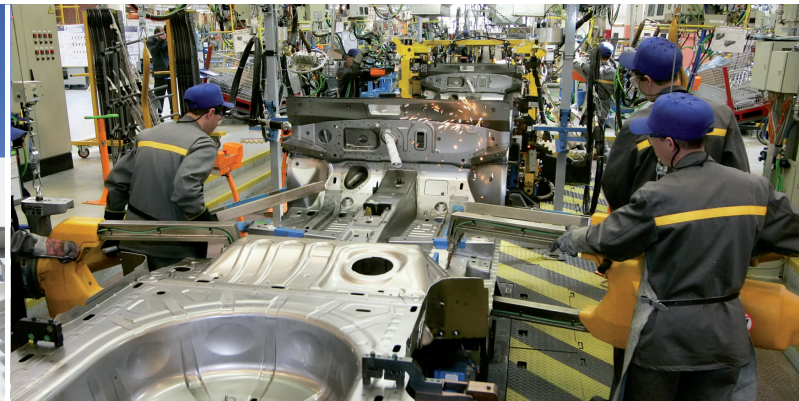
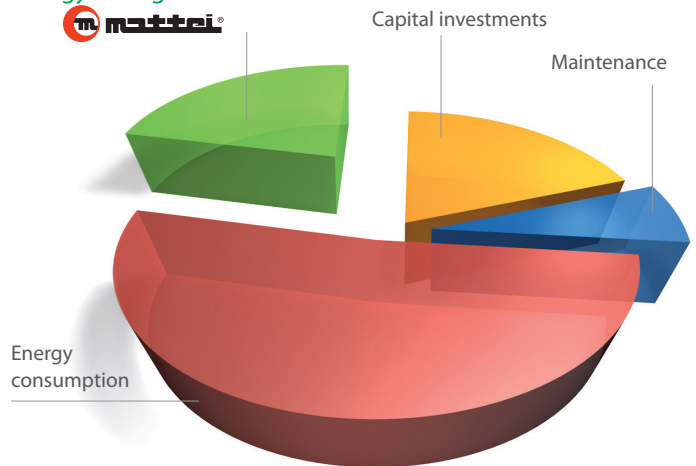


## A real saving opportunity

Compressed air is a reliable and widely used power source in a variety of industrial sectors, thanks to its safe and simple production. On the other hand the use of compressed air involves considerable energy costs, amounting to around 10% of the total industrial electrical energy consumption. The energy efficiency of compressed air production systems is therefore very important in order to reduce their operating costs.

Sizing the compressed air equipment appropriately, choosing the most suitable compressor according to the site's compressed air consumption profile, managing the compression process with advanced control and regulation, systems including appropriate air treatment and energy recovery, are only a few examples of the valuable services that Mattei is able to provide its customers, in order to achieve energy savings amounting to over 30%.

Energy savings with



## More efficient systems

Energy efficiency and subsequently the cost of compressed air, depend partly on the efficiency of the compressors used in the production process and their optimal configuration. It also depends on other key factors such as:



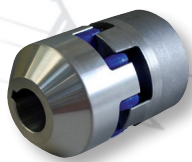
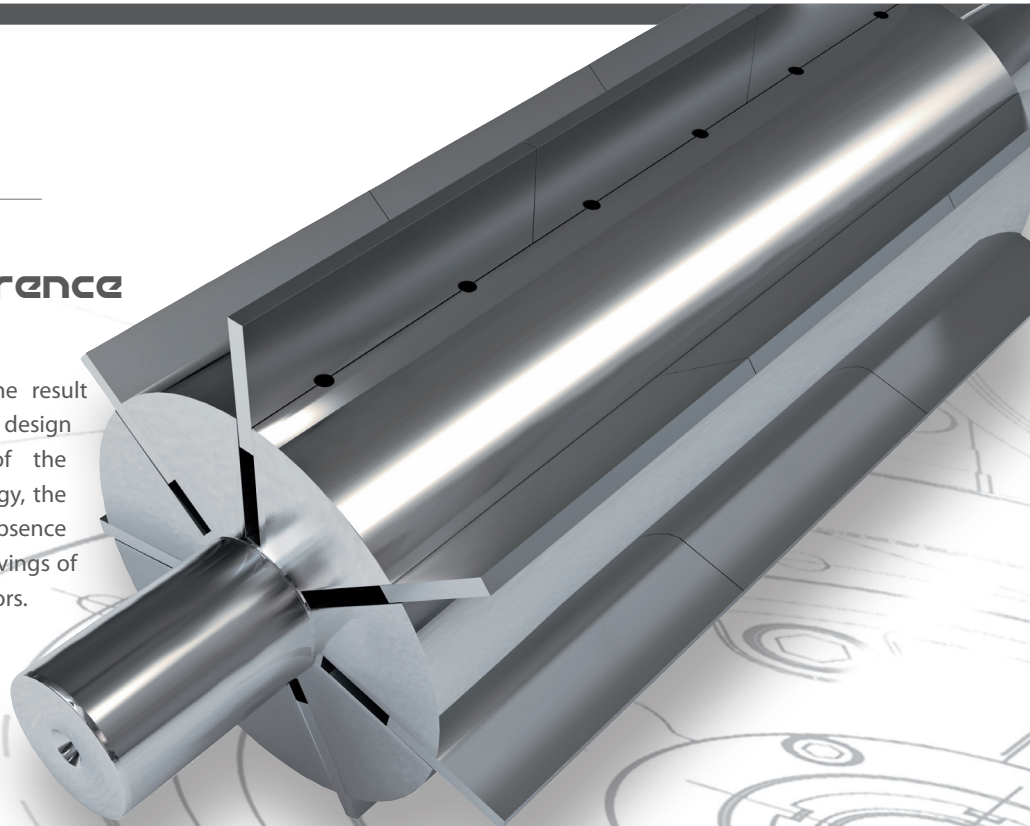
- Air leakage reduction
- Heat recovery
- Overall system design
- Improved air treatment



## Simply different The compressor that makes a difference

### MATTEI'S COMPRESSORS

Mattei's rotary vane air compressors are the result of continuous innovation and advanced design capabilities. The low rotational speed of the compressor unit found only in vane technology, the high volumetric efficiency and the complete absence of roller or thrust bearings, result in energy savings of **over 15%** compared to other rotary compressors.



### EFFICIENCY 1:1

All Mattei's compressors have a 1:1 ratio between the electric motor speed and that of the air end. This means greater energy efficiency and higher performances.

Compared to other technologies, rotary vane compressors guarantee a superior internal air seal, together with a consistent and long lasting performance.

### SAFETY / RELIABILITY

The integrated design, direct coupling, low rotational speed and the limited number of moving parts ensure Mattei's rotary vane air compressors remain safer, more durable and therefore more reliable over time.

### LOW OPERATING COSTS: LOW MAINTENANCE

Mattei's rotary vane compressors are designed to achieve 100,000 hours operating life without the need to replace any blades or other metal parts.

The long operating life of a Mattei compressor is assured by high quality machining which is the essence of rotary vane air compressors.

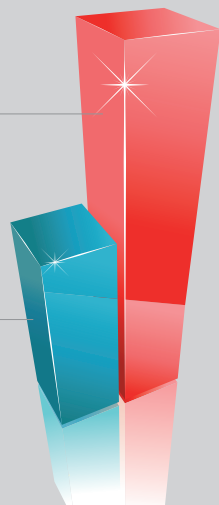
### SIMPLICITY

Mattei's rotary vane air compressors are quiet and can be located almost anywhere. They are quickly installed and take up a limited amount of space.

Their accessible design makes maintenance operations simple and straightforward.

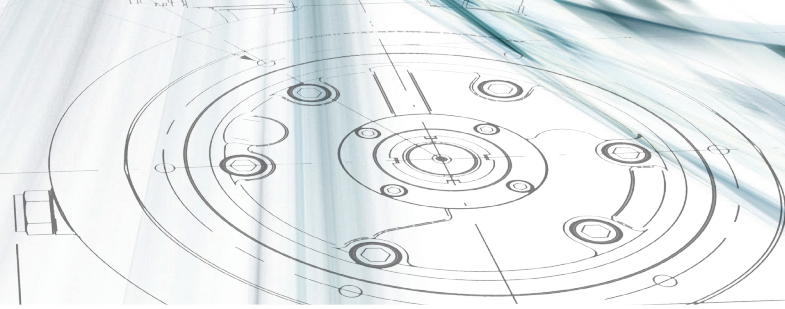
OTHER COMPRESSORS  
MAINTENANCE

MATTEI'S COMPRESSORS  
MAINTENANCE



### QUALITY OF THE AIR

All Mattei's compressors are fitted with a generously sized filtering system, which guarantees quality compressed air suitable for any use. Mattei's very efficient, multi-stage oil separation system produces an exceptionally low lubricant carry-over.



## Evaluating compressed air

When selecting compressors it is very important to know the exact air needs of the user, together with the depreciation period and all other variables that will help to determine the option with the lowest overall cost of ownership.

Measuring the compressed air and energy consumption are essential to find out if changes in the equipment or servicing regime could be cost effective. There is no best compressor in absolute terms, but the best combination between the specific compressed air need and the compressor can always be found.

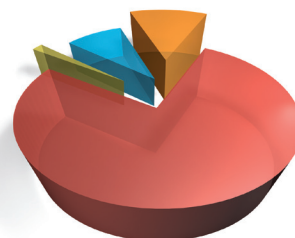


## The best solution to save energy

To ensure maximum energy savings Mattei's OPTIMA range of variable speed compressors leverage mattei's exclusive linear kw-to-capacity efficiencies to match their operation to suit the load profile required by the compressed air system.

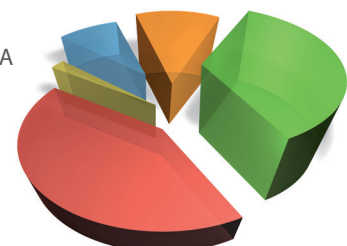
The inverter adjusts the motor's rotational speed, adapting the air delivered by the compressor to the real demand. OPTIMA can save up to 35% of the annual operating costs.

STANDARD



- Installation
- Maintenance
- Investment
- Energy consumption

OPTIMA

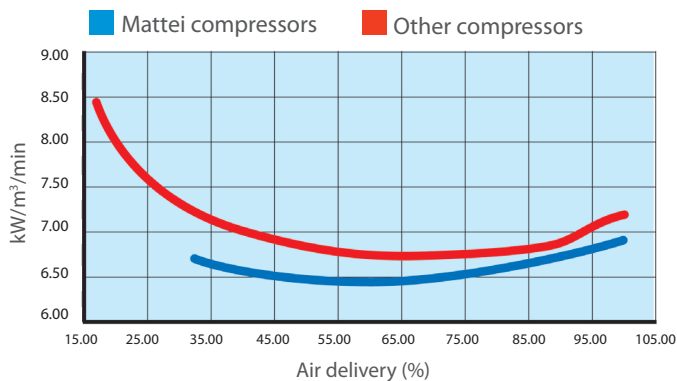


- Savings on energy consumption

## Variable speed principle

Optima operates within a range of pre-set maximum and minimum pressures. When reaching the maximum pressure, at the minimum rotational speed, the intake valve shuts and the compressor is set "off load" and decompressed to 1.5 bar to reduce the energy absorption further.

When the line pressure lowers to the minimum pre-set value it is reset to the "on load" condition and starts delivering air instantly, adapting the rotational speed to the air demand.



## Specific energy efficiency

Mattei's variable speed compressors offer optimum energy efficiency throughout their operating range, thereby reducing the cost of ownership.

## Control with Maestro<sup>XS</sup>



All OPTIMA compressors are, as standard, fitted with a Maestro<sup>XS</sup> electronic controller. Thanks to this device the compressors are programmed to work in two different operating modes: "Neutral Zone" and "PID". OPTIMA adjusts its operation to the load profile required by the system. The inverter modifies the motor rotational speed, adjusting the air flow supplied by the compressor to the actual requirement of the system.

In PID mode the controller uses the average of the set up values as the target pressure and strives to keep the pressure at this value, by increasing or reducing the rotational speed.

## COMPRESSOR AND DRYER: ALL-IN-ONE

The plus version includes the integrated installation of a direct expansion refrigeration dryer, which is air cooled and filled with environmentally friendly gas. The combination



of a Mattei rotary vane air compressor with an integrated dryer and where applicable mounted on an air receiver is the ideal solution for a complete and compact system.

## DURABLE AND QUIET

OPTIMA compressors are epoxy powder coated and corrosion and scratch resistant. In addition they are lined internally with a thick layer of high-quality soundproof material and equipped with a high efficiency cabinet pre-filter. This filtering device prevents the radiator and main air filter from premature clogging caused by impurities in the intake air, thus providing additional cost savings.

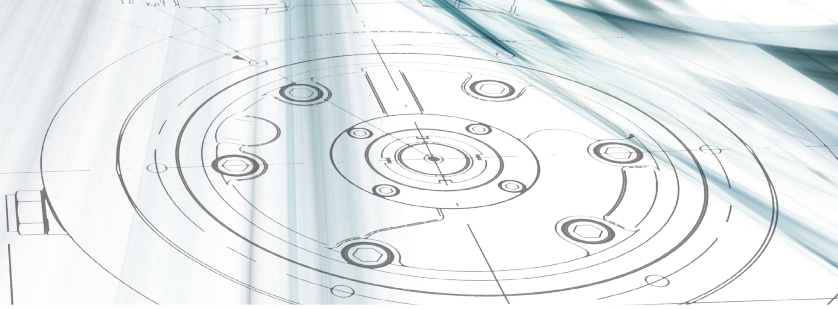
## SIMPLE AND ACCESSIBLE MAINTENANCE

Large hinged doors and easily removable panels allow complete and easy accessibility for all maintenance and intervention operations. The compressor requires no special foundations and its base has suitable lifting points for ease of installation.



## A HIGH EFFICIENCY OIL SEPARATION

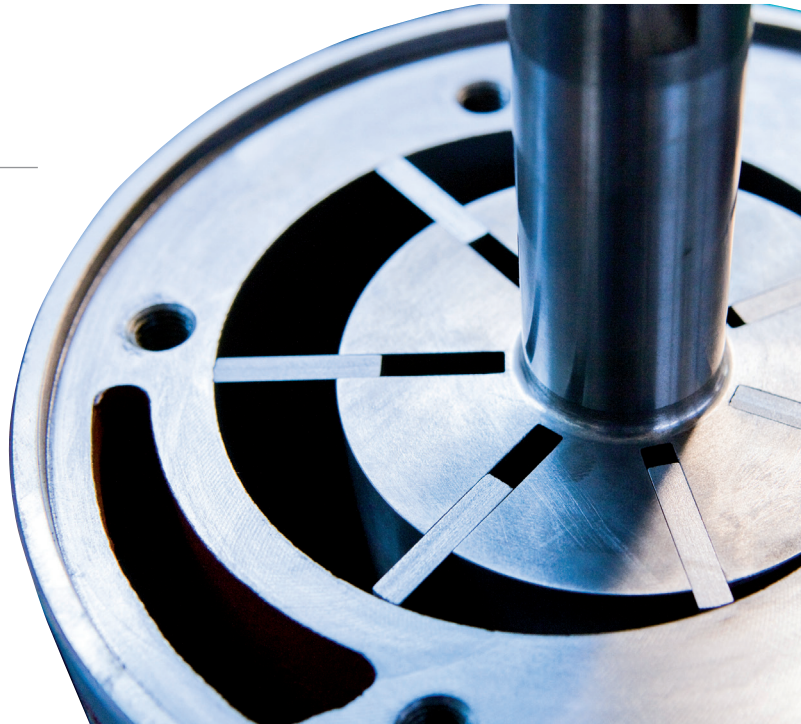
The separation of the lubrication oil from the compressed air takes place in multiple stages. A first separation occurs in the oil chamber as the air passes through a labyrinth path, then it continues at the separator inlet (before the filter) where the air flow slows down passing through a series of directional variations, and finally through the coalescing filter. Due to this superior separation system the oil carry over is extremely low, leading to improved separator life, greater protection for the application and reduced operating costs.



## MAXIMA simply superior

One of the primary aims of competing in the global economy is to minimise production costs. Industry leaders expect maximum value and profitable returns when investing in new machinery that will improve their manufacturing process and lower their costs. As compressed air production tends to be the single largest consumer of electricity in a given manufacturing plant, saving energy and reducing maintenance costs offers real opportunities to improve profitability and thus, enhance the competitive advantage for the company.

Designed to save energy and protect the environment, the MAXIMA rotary vane air compressor range has been engineered by Mattei to meet the requirements of manufacturers that use large, constant volumes of compressed air for long periods of time. Maxima is best suited for high air demand applications where the production of compressed air has a virtually constant base load throughout the day.



- ▶ The best energy efficiency
- ▶ Simple and low-cost maintenance
- ▶ Compression unit designed for over 100,000 working hours
- ▶ Maestro<sup>XS</sup> electronic controller
- ▶ Airend speed: only 1,000 rpm
- ▶ Energy recovery (optional)

## High efficiency motors



The Maxima range is equipped with high efficiency energy saving electric motors.

## Constant pressure



Thanks to its special modulating proportional intake valve, which enables constant pressure air supply, Mattei's compressors can also work without a tank. Through this operating mode, the air flow automatically adjusts to the system requirements.

## MAESTRO<sup>XS</sup>

The Maxima series is equipped with the exclusive state-of-the-art computerised controller, Maestro<sup>XS</sup>. This system automatically controls, monitors and programmes the operation of the compressor, and can be connected to a PC for remote control. If connected to other compressed air packages equipped with Maestro<sup>XS</sup>, the unit can become master of a compressed air plant, thus saving on the installation of an additional controller. Maestro<sup>XS</sup> can be interfaced via web or cellular technology to provide remote service monitoring.



## The astounding result of continuous R&D and advanced technology

The name of this compressor was selected to evoke the essence of the incredible performance of this machine. Maxima lives up to its name by delivering maximum performance from every kW of input energy. Mattei's ethos of continuous investment in research and development of its rotary vane technology has led to the excellent specific energy efficiency of the Maxima range.

**As low as 5.4 kW/m<sup>3</sup>/min**

## Maxima 110 – 160

### TWIN COMPRESSION SYSTEM DOUBLE EFFICIENCY

To achieve maximum performance, Maxima 110 and Maxima 160 are equipped with twin compression units that work in parallel at the same speed as all Maxima compressors – an incredibly low 1000 rpm.

### COMPRESSOR AND DRYER: ALL-IN-ONE

The plus version includes the integrated installation of a direct expansion refrigeration dryer, which is air cooled and filled with environmentally friendly gas.

This solution provides the advantages of:

- reduction in installation costs
- reduction in space requirement



### LOAD ADPTABLE COOLING

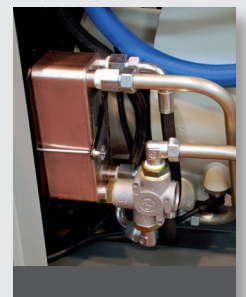
Maxima's two-speed electric fan automatically adapts the cooling air flow required to remove the heat generated by changing plant air demands and environmental conditions. At normal operating temperatures Maxima cools the oil, air and system components at the lower fan speed, thus providing considerable energy savings. When operating conditions increase the heat load, the fan speed automatically increases to provide the additional cooling required.

### OIL-WATER SEPARATOR KIT\*

Integral, compact & efficient oil/water separator kit that works on the principle of coalescing filtration. This system reduces oil contamination and guarantees a better quality of condensate.

### HEAT RECOVERY KIT\*

The heat recovery system is integrated directly into the compressor cooling system. Before reaching the oil cooler, hot oil passes through an oil-water heat exchanger controlled by a thermostatic valve to provide water pre-heating to save energy and money in industrial or sanitary process applications.



### CONDENSATE SEPARATOR AND DRAIN KIT\*

The condensate separator uses cyclonic action and gravity to remove liquid condensate out of the airstream.

The condensate separator and drain kit:

- maximises efficiency & reliability of dryers and filters
- protects downstream processes and equipment

\* Installed options

# CONTROLLERS ENERGY SAVING



## MAESTRO<sup>XS</sup>

### Technology at hand

Maestro<sup>XS</sup> is able to adjust the compressor's operation to the specific requirements of the system it is connected to. It is equipped with programming levels and special control and analysis options regarding the compressor's status and any faults that have occurred. Even if the electrical supply fails, Maestro<sup>XS</sup> is able to store the compressor settings and all its operating data.

### Integrated communication

The connection to a MATTEI supervising device enables remote monitoring through a web interface and alarm signalling by e-mail, fax or mobile phone.



## Maestro<sup>XS</sup>: Features and Functions



- Ergonomic control panel with quick access keys to main menus.
- Menus access keys, start, stop and reset led keys.
- Semi-graphic LCD display with illuminated text.
- 24 Vdc digital inputs.
- Digital dry contacts output up to 230 Vac and up to 24 Vdc.
- Interfaces:
  - RS485 for intercommunication with other MAESTRO devices.
  - RS485 (optional) to communicate with the supervising PC and network.
- Analogue data display (line pressure, chamber pressure, oil temperature, outgoing air temperature) and general data (alarms, operating messages, machine state, maximum and minimum pressure, last start and stop times).
- Hour counter to display the enabled, working and load times and maintenance notices.
- Events database to store alarms and blocks, with alarm intervention indication, alarm intervention time, machine state.
- Multi-language user interface.
- Weekly and hourly programmable start and stop times.
- Immediate reading of the compressor operating data on the display.
- Basic and advanced parameters programming for an optimal operation of the compressor.
- Storage of up to 20 malfunctioning events.
- Storage of the last 20 programme modifications.
- Control of the integrated dryer.
- Machine start and stop remote control.
- The feedback (as standard), through dry contacts, of the following machine states: enabled compressor, working compressor, loaded compressor, blocked compressor.