



MAESTRO XB

USER MANUAL TEFA2G-214

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GENERAL INFORMATION

1.0 Introduction

This manual is intended for technicians, Mattei installers and all customers who intend to acquire notions regarding operations MAESTRO XB electronic board.

The manual contains the characteristics in terms of HW and SW and the operating modes.

MAESTRO XB is a programmable device used to control the compressor, capable of adapting its operation to the specific requirements of the air network to which it is connected. It has various programming levels and possibilities for operation and fault control/analysis. The advanced programming and analysis levels are protected by digital codes in order to prevent involuntary tampering. It also has a memory which maintains the settings carried out over time as well as the operating data even if the compressor is not connected to the electrical mains or in the event of a power failure. Weekly scheduling can be carried out for start-up/shut down (Optional).

1.1 Identification codes

Maestro XB is made up of two hardware devices which are identified by means of a code.

These codes are:

Code	Description
AC40B37297	Base control module.
AC40B25386	Expansion module.

Table 1

These codes uniquely identify the parts which make up the control device. Only the use of the expansion module requires careful installation.

HARDWARE DESCRIPTION

As already mentioned, the Maestro XB hardware is made up of a central unit and an expansion. The central unit takes care of managing most of the compressor management and control functions, while the expansion board manages optional functions such as managing a dryer and a clock for weekly scheduling.

Characteristics of the main board

Power supply voltage	24 Vac ±10%
Power frequency	50 / 60 Hz
Operating temperature	-20 + 60°C
Humidity	90% R.H.
Front grade of protection	IP 65
Display	Graphic 144 x 32pxel
Keyboard	5 buttons
Memory	Flash >512 Mb
Number of digital inputs	7
Digital inputs power supply voltage	12 Vdc
Number of digital outputs	6
Type of control signal	Free voltage
Output contact capacity	
Maximum permitted voltage	230 Vac
Maximum permitted current	5 A resistance
Line pressure probe	
Probe power supply voltage	12 Vdc
Type of signal	4 ~ 20 mA
Oil temperature probe	
Type of signal	NTC

Characteristics of the expansion board

Number of digital inputs	1
Digital input power supply voltage	12 Vdc
Number of digital outputs	2
Type of control signal	Free voltage
Output contact capacity	
Maximum permitted voltage	230 Vac
Maximum permitted current	5 A resistance
Dryer temperature probe	
Type of signal	NTC

2.2 User interface

As previously indicated, Maestro XB carries out control of the compressor, indicating the system pressures and temperatures to the user and it allows operation to be configured. All of this takes place through an interface made up of a display and a keyboard. The purpose of the former is to display the information and allow programming of the device. The keyboard, on the other hand, carries out the active function of entering data and allows navigation of the menus.



The Maestro XB display has backlighting which is activated as soon as a button is pressed in order to make it easier to read. It has 2 lines of 16 characters each which allow all the parameters to be viewed. The only limitation is that accented characters cannot be used, which therefore limits use in those languages which make wide use of special characters.

The keyboard is made up of 5 buttons which carry out the various functions described below:



ON/OFF Button: Allows the compressor to be enabled and disabled.



Increases Button: Allows navigation through the various software menus and also serves the purpose of increasing the value of a variable when making changes.



Decreases Button: Allows navigation through the various software menus and also serves the purpose of decreasing the value of a variable when making changes.



Enter Button: Allows access to the selected menus and opens and closes the memory during editing. "Clock mode" disable single activity days programming.



Esc / Reset Button: Allows the user to move one level up while navigating within the menus. It also carries out the "Reset" function for any faults present.

OPERATING MODES

MAESTRO XB is factory set to drive the compressors and deliver compressed air at rated pressure. There are 3 different operating modes, each of which can be selected by the user:

- continuous;
- automatic;
- modulation.

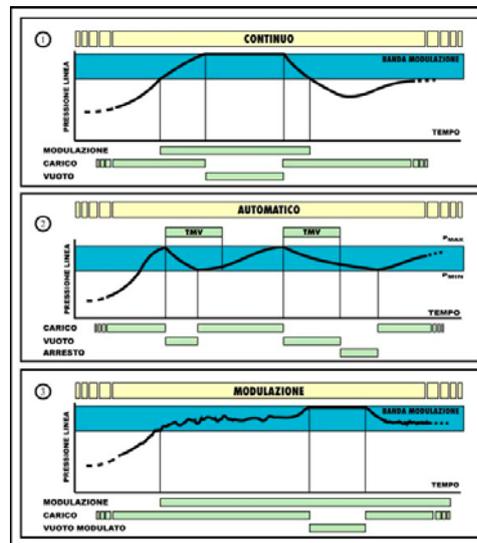


Fig. 1 (Figure 1 below illustrates the various available options).

3.1 CONTINUOUS mode

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 (P_{max}) 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 (P_{min}) 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.

N.B.

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.

3.2 AUTOMATIC mode

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 P_{max} , 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 P_{min} ;
2. if line pressure falls to P_{min} 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 P_{max} . This means that P_{max} can only be reached in case of very low or nil demand.

N.B.

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.



MAESTRO XB provides a control algorithm which assures a proper oil temperature value and avoid an excessive and consecutive starts and stops number. Following the previous chapter description, if conditions to stop compressor before elapsing “minimum running time - TMF” would have been reached (10 mins set up and active just with AUTOMATIC mode) the effective stop is postponed until the preset delay value. Elapsed that delay, after any following UNLOAD running time, compressor will stop at TMV (Unload Running Time). TMF delay will be recall at next compressor start. If User would manually operate disabling or enabling compressor, such an algorithm will be overridden.

3.3 MODULATION mode

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 P_{max} and P_{min} settings and operates the compressor without stopping except in case of an operator command.

N.B.

The modulation bandwidth is typically 0.3 bar.

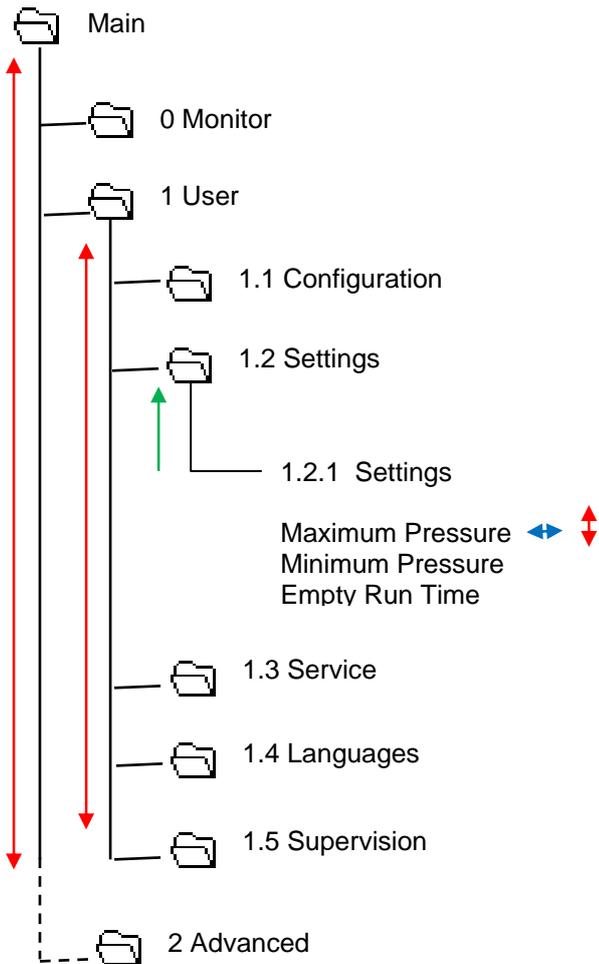
Suppose the maximum no-load pressure is set (using the SERVO-VALVE) to 7.3 bar.

- 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.

MENU STRUCTURE

In order to dialogue with the user, MAESTRO XB uses an interface menu that allows for monitoring and programming of the compressor. These menus are subdivided by function and are not all accessible to the end customer. In fact, some menus are protected by one or more passwords.

The structure of the software menus is comparable to the way computer folders are organised where the menu [Main] is the root and the various sub-menus make up the various folders.



-  To navigate through the pages.
-  To navigate through the variables on a page.
-  To open and close the memory to edit a variable.
To confirm a selection.
-  To move up one level from the sub-menu.
To "Reset" an alarm.

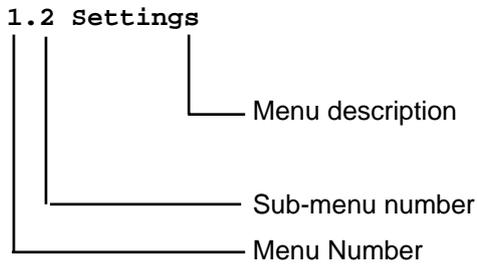
main menus for compressor management are:

Menu	Identifying menu	User access	Password
Monitor	0	Yes	No
User	1	Yes	No
Advanced	2	No	Yes
Clock	3	Yes	No
Memory	4	Yes	No
Info	5	Yes	No

Table 2

In order to simplify finding a variable, each menu has been identified with a number and the same is true for the program sub-menu.

The reading key for the pages is indicated below.



There is also text in the various menus which informs the user of the variables meaning and the functions they perform.

Attention:

Only the menus that can be accessed by the end customer are translated into the various languages available in the software, whereas only Italian and English are available in the password protected menus.

Note

Hereafter the menus or sub-menus will be identified by text between [], whereas the items of the individual pages will be identified by text between “ ”



If User wouldn't press any button within one minute, program will come back to the first default menu page [Monitor].



Remember that when the device is powered it automatically goes to the menu [Monitor].

Let's look at an example of how to navigate between the menus, assuming we want to edit the maximum pressure value of the first band of use. The other parameters that make up the program can also be modified (if authorised).



Menu
0.0 Monitor

The [Main] menu page is displayed.

Menu
1.0 User

The maximum pressure value that we want to edit is in the [User/Settings] menu, therefore we must first move the cursor to [User], using the <↓> button.

Once the desired menu is selected press the <↵> button to access it.

1.0 User
1.1 Config.ion

Once inside the [User] menu, the first selectable sub-menu is displayed.

1.0 User
1.2 Settings

Use the "arrow" buttons to display the sub-menu

1.2 Settings

Press <↵>.

Pressure band:
BP1

The operating band selection screen will be displayed.

Maximum Pressure
BP2 7,7bar

However, we want to change the maximum pressure value associated with the second band, so we will press the <↓> arrow button until the desired variable is displayed.

Maximum Pressure
BP2 7,7bar

Press <↵> and the pressure value will begin to flash, indicating that it can now be edited.

Use the arrow buttons to modify the value as desired and then press <↵> again.

Maximum Pressure
BP2 7,5bar

The variable value stops flashing, indicating that the change has been memorised.

Menu
0.0 Monitor

Now press <Esc> until the [User] menu is displayed and press the button again to go directly to the [Monitor] menu, otherwise select another menu.



All of the menus are the circular type. In other words the up or down buttons can be used indifferently to select a variable.

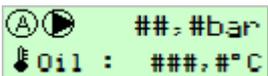
4.1 [MONITOR] Menu

The [Monitor] menu is the core of the entire software. Here the line pressure and compressor temperatures can be monitored and the operational state, hours of operation, etc. can also be checked.

Given the importance of this menu, if for whatever reason you are in other sections of the software, after a period of inactivity (60") on the terminal keyboard, the system will automatically display the first screen of the menu.

The information displayed on this menu may be visible only if the function is active or if the corresponding control probe is present. For example, the dew point temperature will only be displayed if the dryer is activated.

The first page of the menu is shown below, therefore the following is visible:



- Active working mode (icon)
- Unit status (Icon)
- Presence of any notifications (icon)
- Network configuration mode (icon)
- Line Pressure
- Oil temperature

This is the program default page; it will be displayed in case of keyboard inactivity.

Other informations are available scrolling through the menu pages, specifically:

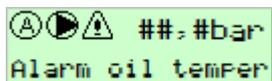
- Hours of enabling,
- Hours of operation,
- Hours of load,
- Dew point temperature (only if this option is active).

On the first page any compressor faults are also displayed. This information is displayed through a scrolling description of the faults on the second row of the display.

However, we must sub-divide the signals into 2 large families which are:

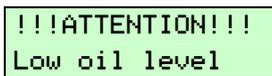
- Alarm signalling
- Lock signalling

In the first case the compressor has not stopped, but the fault is signalled until the condition is restored or the compressor stopped.



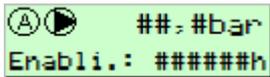
In the event of an alarm, this is indicated by scrolling text which describes the fault only on the second row of the display.

On the other hand, in the event of a lock the compressor is stopped and an operation by an operator is required to restore it.

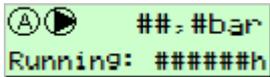


In case of a block, the indication occupies the entire display as indicated adjacently. The second row will display scrolling text as in the case of an alarm signal which describes the cause of the lock.

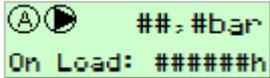
To view the other informations on the monitor menu press the <↓> arrow button. You will note that the information varies only on the second row. In fact, the first row constantly displays the machine status and the line pressure. This allows the basic information to be kept continuously under control.



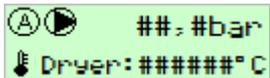
Subsequently the hours of compressor enabling are displayed.



Moving down the hours of operation is displayed.



Moving farther down the hours of load is displayed.



The last screen displays the dew point temperature which, however, will be displayed only if the dryer option has been enabled.



ATTENTION:

All the menus are the circular type. In other words, both the <↓> and the <↑> buttons can be used to change the menu item.

Following table summarise all the ICONS (and their meaning) which can be displayed.

Operating mode	Unit status	Notifications	Network mode setup
 Automatic mode	 Disabled	 Fault	 Master
 Continuous mode	 Enabled in STAND-BY	 Timing program enabled	 Slave
 Modulation mode	 ON LOAD	 Pressure-switch disabled	
	 UNLOADED	 Network communication fault	
	 BLOCKED		

Some of the icons could be blinking: here below their meaning:

Blinking ICONS description	
	After disabling, unit is stopping
	Timing program is enabled, but out by time slot

4.2 Menu [MAIN]

The [Main] menu is the one to which all the various configuration menus belong. When the controller is powered, after an internal check carried out to verify proper operation, the software will display the first page of the [Monitor] menu. To access the [Main] menu, press “Esc” and the first item of the main menu will be displayed.

The various items that make up the main menu are indicated below.

Menu 0.0 Monitor	Accesses the Monitor menu where the informations relative to normal compressor operation will be displayed.
Menu 1.0 User	Accesses the menu that allows the user to set the desired compressor operation.
Menu 2.0 Advanced	Accesses the advanced menu where authorised personnel can enable and configure the various available functions.
Menu 3.0 Clock	Accesses the clock menu (only if the expansion module is present) where weekly scheduling can be enabled.
Menu 4.0 Historical	Accesses the program memory menu, allowing any logged faults to be displayed.
Menu 5.0 Info	Provides informations on the software version.

4.3 Menu [USER]

This menu, accessible by the end user, allows compressor operations to be calibrated. The variables contained in these sub-menus can be modified by the user.

Here the user can configure compressor operations based on his own needs without assistance from technical support.

1.0 User 1.1 Configuration	Configuration Menu: This sub-menu allows configuration of the operating mode and the compressor control mode.
Operation: Automatic	It defines the compressor operating mode, specifically: <ul style="list-style-type: none"> • Automatic • Continuous • Modulation
Control: Probe	This defines the reference pressure sensor for operation, specifically: <ul style="list-style-type: none"> • Pressure probe • Pressure switch
1.0 User 1.2 Settings	Settings Menu: The compressor operating pressures can be set in this sub-menu.

M E N U S T R U C T U R E

Pressure band:
BP1

This item allows the desired pressure band to be selected. 3 bands are available which are identified as indicated below:

- BP1
- BP2
- BP3

Maximum Pressure
BP1 7,7bar

On this screen the maximum pressure inherent to the "BP1" band is asked.

Minimum Pressure
BP1 6,5bar

On this screen the minimum pressure inherent to the "BP1" band is asked.

Maximum Pressure
BP2 7,7bar

On this screen the maximum pressure inherent to the "BP2" band is asked.

Minimum Pressure
BP2 6,5bar

On this screen the minimum pressure inherent to the "BP2" band is asked.

Maximum Pressure
BP3 7,7bar

On this screen the maximum pressure inherent to the "BP3" band is asked.

Minimum Pressure
BP3 6,5bar

On this screen the minimum pressure inherent to the "BP3" band is asked.

Idling time:
120sec

Defines the vacuum operating time before the compressor is stopped.

1.0 User
1.3 Service

Service Menu: This sub-menu allows the compressor maintenance intervals to be set.

Oil change:
5000h

Defines the frequency of maintenance relative to oil and oil filter change.

Separ. Change:
10000h

Defines the frequency of maintenance relative to separator filter change.

Oil hours:
00000h

Displays the accumulated hours of operation of the oil.

Separator hours:
000000h

Displays the accumulated hours of operation of the separator filter.

When a counter reaches the number of hours set for maintenance this is signalled on the display. This signalling does not stop the compressor, but advises of the need to carry out the scheduled maintenance (i.e. Oil change).

```
Language:
  Italian
```

The following languages are available:

- **Italian**
- English
- French
- German
- Spanish
- Czech
- Polish
- Portuguese
- Russian
- Chinese



Attention: the password protected menus will only be in Italian / English.

```
1.0 User
1.5 Network
```

Network Menu: This allows for the creation of small networks of compressors equipped with Maestro XB.

```
Slave:
  No
```

If enabled, Master unit will command start/stop (please remind to enable unit by ON/OFF button).

```
1.0 User
1.6 Switching
```

Rotation Menu: This menu item, like the subsequent ones, will be displayed only if:

- *The module is present (expansion).*
- *Communication in ModBus is active and has like address "1".*

```
Switching
  None
```

Here you can select the type of rotation for selection of the base compressor. The possible selections are:

- **None**
- Daily
- Weekly
- Monthly

Remember that "network" operation is not the same as for compressors equipped with controls like Maestro and Maestro XS. See the specific chapter.

```
N. Compressor:
  #
```

On this screen you must indicate in the program how many compressors are connected (**Max 3**).

```
Operating mode:
  Single
```

NETWORK mode selection:

- **SINGLE**
- MULTIPLE

If "single" is selected, just one unit will be enabled. If network pressure would drop down below Pmin, other units won't be started except for active unit fault. If "multiple" is selected, once network pressure would be below Pmin, other units will be started after the first one.

```
Start delay :
  10sec
```

Those pages are displayed only if "multiple" mode is selected.

Those allow to set up :

Following Start delay between two units

If network Pressure is close to Pmax, "units exclusion time"

```
Stop delay :
  10sec
```

4.4 Menu [CLOCK]

This menu is accessible only if the expansion module (code AC40B25386) has been installed and allows the user to start the compressor or the compressor network completely autonomously, in other words, without the aid of an operator who physically carries out start-up.

```
Mon 99/mm/aaaa
hh:mm
```

The first screen of the menu displays the system date and time as well as the day of the week. The latter is calculated automatically based on the set date.

```
Weekly Program
None
```

```
①②③④⑤⑥⑦
-----
```

If weekly scheduling is enabled, a summary screen of the week will be displayed.

The first week is represented as:

```
① F1 ON 00:00
BP1 OFF 00:00
```

① = Monday

② = Tuesday,...

```
① F2 ON 00:00
BP1 OFF 00:00
```

Move the cursor to the desired day and press "Enter" to access programming for the desired timeslots.

For each day of the week there are 3 scheduling timeslots and for each timeslot you must provide the following information:

```
① F3 ON 00:00
BP1 OFF 00:00
```

- Start time,
- Stop time,
- Pressure band.

Press "Esc" to return to the summary menu.

4.5 Menu [MEMORY]

4.0 Historical

4.1 Events

```
Auto/Load   01
Cod. ##     #####h
```

```
Auto/Load   01
###, #bar   ###, #°C
```

Events Menu: This menu allows any faults which impacted compressor operation to be displayed.

For each stored event there are two screens in order to be able to contain all the informations, specifically:

- The event number,
- The machine state and configuration,
- The event code,
- Hours of Operation,
- The line pressure,
- The oil temperature.

All the stored data are logged at the time of the fault, thereby creating a photograph which helps technical support to understand the possible problem.

10 failures are recorded, from 00 to 09. Last is 00 and it shifts the others “down”: just the last 10 events are maintained.

4.0 Historical

4.2 Starts

```
Total      :0284
Daily      : 030
```

Start-up Menu: it is possible to know the number of start-ups carried out by the compressor. This provides useful information on compressor operation.

In particular the number of total start-ups can be displayed and, if the clock module is present, the number of daily start-ups can be viewed.

ALARMS DISPLAY AND MEMORY

In the Maestro XB memory menu, as mentioned in the menu descriptions, some data relative to the compressor are logged. Specifically any faults and the number of start-ups carried out by the compressor are logged.

Accessing the [Memory] menu the screen below is displayed.

```
4.0 Historical
4.1 Events
```

There are 2 sub-menus listed in the menu which subdivide the data stored in the device. These sub-menus are:

```
4.0 Historical
4.2 Starts
```

1. Events,
2. Start-ups.

5.1 Events Sub-menu

During compressor operation faults may occur in one or more of its parts or temperatures higher than those anticipated for correct operation may occur. These faults must be intercepted and appropriately managed by the control unit, preventing the compressor from encountering more serious problems or even a breakdown.

These faults, defined as "Events", can be sub-divided into 2 categories with quite different operational performance. These two categories are:

- Events which generate an "Alarm",
- Events which generate a "Lock".

5.1.1 Alarm Mode

If the type of event is not serious enough to cause immediate breakdown or serious malfunction of the compressor, it is defined as an "Alarm". The user is immediately signalled but it does not cause the compressor to be stopped.

It is understood that this event must be verified and it may be necessary to contact technical support in the event of a repeated notice.

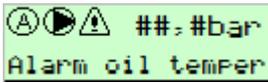
5.1.2 Lock Mode

Unlike the alarm mode, the "Lock" mode stops the compressor. An event of this type can cause serious damage to the compressor which must therefore be immediately stopped in order to prevent more serious consequences.

These events must be assessed very carefully by technical support.

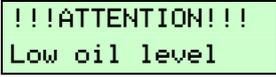
5.1.3 Displaying events

WARNING and TRIP are differently reported to the User.



In the event of an "Alarm" on the lower row the description is displayed in scrolling test format.

On the first row, on the other hand, the compressor operating data remains displayed. This signal ceases when the cause that triggered it ceases.

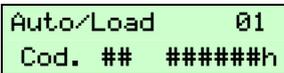


Whereas, in the event of a lock, the notice occupies the entire display in order to point out the presence of a fault.

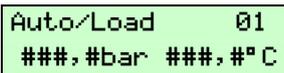
Press <ESC> button to come back to [MONITOR] menu and perform a clear and deep investigation about fault reasons and how to fix those before to restart the unit.

5.2 Displaying stored events

Enter the [Events] sub-menu to view the last event logged in the memory. Because the display is small, for each event two pages are required, where the following informations are listed:



- The event number,
- The machine state and configuration,
- The event code,
- Hours of Operation,
- The line pressure,
- The oil temperature.



All the stored data are logged at the time of the fault, thereby creating a photograph which helps technical support to understand the possible problem.

All this informations allow technical support to identify the type of compressor malfunction. The control unit stores a maximum number of **10** faults.

Any additional events will overwrite the memory restarting from event "01". The most recent event will be recognisable because when you access the events menu the one displayed will actually be the last fault logged.

The table below lists all the fault codes in the system. The type and possible cause of the fault which occurred are also indicated.

Notification	Action	Cod	Type	Cause
Emergency Stop	Block	00	Digital	The electrical panel emergency stop push button has been pressed.
Low Oil Level	Block	01	Digital	Low oil level in the chamber (the quantity of oil is less than what is necessary for correct operation).
Overload. Motor	Block	02	Digital	Main electric motor overload.
Phases inverted	Block	03	Digital	Indicates that the network connection is incorrect or connected out of phase.
Temp. Alarm Oil	Alarm	04	Analogue	The compressor oil temperature has exceeded the alarm temperature.
High Temp. Oil	Block	05	Analogue	Compressor oil high temperature.
Air Filter Clogged	Alarm	06	Digital	Indicates that the air filter is clogged. This alarm is available if the machine has the specific sensor.
Low oil temperature	Inhibition	07	Analogue	Prevents start-up of the compressor if the oil temperature is too low.
Ice Alarm	Alarm	08	Analogue	Indicates excessive cooling of any dryer that may be connected. This signal is treated as an Alarm.
	Block	09		Indicates excessive cooling of any dryer that may be connected. This signal is treated as a lock.
High Dew Point	Alarm	10	Analogue	Indicates failed cooling of any dryer that may be connected. This signal is treated as an Alarm.
	Block	11		Indicates failed cooling of any dryer that may be connected. This signal is treated as a lock.
Inverter fault	Block	12	Digital	Indicates malfunctioning of the Inverter.
Oil Change	Alarm	13	Service	Indicates the need to change the oil due to the number of hours envisaged for changing being reached.
Separator change	Alarm	14		Indicates the need to replace the separator filter due to reaching the number of hours.
BlackOut	Alarm	15	----	Indicates a loss of power to the compressor (only if the enabling option is enabled).
S. Line Fault	Block	16	Software	Indicates a fault with the pressure probe mounted in the radiator. Also indicates an interruption of the connection.
S. Oil Fault	Block	17	Software	Indicates a fault with the temperature probe mounted on the compressor. Also indicates an interruption of the connection.
S. Dew Fault	Alarm	18	Software	Indicates a fault with the temperature probe mounted on the dryer. Also indicates an interruption of the connection.
Clock Error	Alarm	19	Software	Clock module defective or low battery.
Expansion Error	Block	20	Software	Indicates a communication fault between the base board and the expansion board
Serial error	Alarm	21	Software	Indicates a lack of communication on the ModBus port when compressors are connected to one another.

5.3 Start-ups Sub-menu

In this sub-menu the start-ups carried out by the compressor during its operating life can be monitored. Specifically we can monitor:

Total	:	124
Daily	:	10

- The total number of start-ups carried out by the compressor.
- The number of start-ups carried out daily by the compressor, only if the expansion module is installed.

The second counter is reset each time the on board clock passes midnight.

These counters are useful for verifying correct compressor settings. If the machine is configured well, the number of daily start-ups will be limited.



Attention:

If controller should fail and you would replace it, it's not possible to upload the hystorical data onto the new device. If necessary, old events must be noted before switch-off.

PASSWORD MANAGEMENT

Maestro XB is protected from any tampering by unauthorised personnel by means of access passwords for the various menus and particular functions. These can be subdivided into two categories which are:

- USER Password
- SERVICE Password

6.1 USER Password

This has the simple function of allowing the user to delete the maintenance event. In fact, when the time set in the [User \ Service] menu it is signalled by means of notice on the screen.

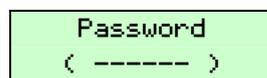


Fig. 2

To delete the signal triggered by the hour counter a password must be entered. The purpose of this is to prevent unauthorised personnel from involuntarily deleting the signal.

The password is made up of a combination of some buttons which, pressed in sequence, form a sort of combination.

This must be entered when requested in the special template shown below.



The **User** password is: <↑> <↑> <↓> <↓> <↑> <↓>

WEEKLY SCHEDULING

Chapter 7

After the installation of the expansion module with clock card (RTC), Maestro XB allows the automatic start and stop programming all week long.

For each day of the week there are three operating "Timeslots" available which allow flexible scheduling throughout the day.

These timeslots have operational priority:

- Timeslot 1 High priority,
- Timeslot 2 Medium priority,
- Timeslot 3 Low priority.

For each timeslot the following can be set:

- Start time,
- Stop time,
- Pressure band.

Possibility to set different Pressure bands for each Timeslot allows a very flexible system operation suitable for each requirement of the User.



The pressure bands must be configured ahead of time in the [User \ Settings] menu.

Maestro XB also allows continuous features to be managed during the week, also allowing system operating pressure variations. This makes scheduling even more flexible.

However, you must take great care when entering the start and stop times. In fact, although there are checks and guides, it is possible to carry out scheduling inconsistent with operation.

Remember also that for continuous operation all the days that you want to use the compressor must be scheduled. For example, if you want continuous operation from Monday to Friday, in order to obtain this operation you must necessarily schedule all of the intermediate days.

7.1 Programming

Setting the clock takes place in a simple and functional way, also allowing particular compressor operating modes to be managed.

After configuring the pressure bands in the [User] menu they can be recalled from the clock menu, thereby allowing us to make the compressor work at different operating pressure values during the day.

```
Mon 99/mm/aaaa
hh:mm
```

Go to the [Clock] menu. The basic clock settings page will be displayed.



Attention: Maestro does not manage Daylight Savings Time. The change in time must be carried out manually.

```
Weekly Program
nessuna
```

Press <↓> to display the screen which allows time programming to be activated.

```
①②③④⑤⑥⑦
- - - - -
```

If enabled a summary screen is displayed where any daily scheduling and whether they are active will be indicated. The cursor, which can be identified because it is flashing (for convenience it is shown here in bold) goes to the first day of the week (①).

```
①②③④⑤⑥⑦
- - - - -
```

Press the <↑> <↓> arrow buttons to move the cursor to the day of the week that you want to configure (Wednesday in the example).

```
④ F1 ON 00:00
BP1 OFF 00:00
```

Press the <↓> button to access programming. The screen for programming timeslot No. 1 will be displayed.

```
④ F2 ON 00:00
BP1 OFF 00:00
```

Press the <↑> <↓> buttons to select the other scheduling timeslots.

```
④ F1 ON 00:00
BP1 OFF 00:00
```

Supposing you want to schedule only the first timeslot, press the <↓> button. The start time will begin to flash indicating that the hour can be changed. Press the <↑> <↓> buttons to set the start time.

```
④ F1 ON 08:00
BP1 OFF 00:00
```

Then press the <↓> button to move the cursor to the minutes and use the <↑> <↓> again to change the minutes.

Press the <↓> again and the cursor will move in the following order:

- Stop time,
- Start time,
- Select pressure band.

```
④ F1 ON 08:00
BP1 OFF 17:00
```

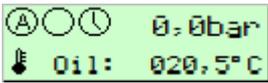
Press the <↓> again and the cursor will stop flashing, saving the programming which was carried out.

```
④ F1 ON 08:00
BP1 OFF 17:00
```

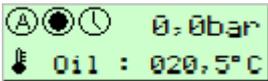
In case of error, repeat the operations described above, correcting the incorrect parameter.

```
①②③④⑤⑥⑦
- - - ■ - - -
```

Press < Esc > to return to the summary page. You will note that under the day which was just programmed a square appears. This indicates that at least one scheduling timeslot is active.



Once the programming, a flashing icon shaped of the watch appears in the notifications area of the screen; this means that an hourly scheduling is enabled.



Enabling the compressor, the stand-by icon will be displayed. This means that compressor is ready to start as soon as the clock reaches setting timetable.

When the Start time is reached, the clock icon will stop flashing and compressor will be started or made available according to the needs of the network.

At the end of the Time slot, clock icon back to flash and stopping procedure begins.

7.2 Temporary daily bypass

One or more days of the week can be excluded from normal operation. This may be necessary for scheduled maintenance operations which require the machine to be stopped for a certain day or for other reasons.

To carry out the exclusion, go to the [Clock] menu and select the scheduling summary page.



In the adjacent screen you can see an example of active scheduling which manages five work days.



To exclude one or more days from weekly operation, you must select the day to be disabled using the <↑> <↓> buttons. Then hold the <↵> button in for 5 seconds. An "X" will be displayed which indicates that the scheduling for that day will not be considered and the compressor will remain stopped.



To enable operation again select the disabled day and hold in the <↵> button for 5 seconds again. The "■" symbol will be displayed which indicates that it has been enabled again.

Return to the [Monitor] menu by pressing < Esc >.

7.3 Exclusion from weekly scheduling

In the event that the time scheduling must be temporarily excluded, simply access the [Clock] menu and change the value from "Active" to "None".

The memorised times will not be lost, but will remain stored even if the expansion card where the clock resides is removed.



Remember that **the compressor cannot be used** outside of the timeslots provided for use. Scheduling must be disabled.

7.4 Special programming

Maestro XB allows to set a continuous operating of compressor for following days.

Supposing the compressor must be used from Monday to Wednesday in continuous mode, the following configuration can be set.

```
① F1 ON 06:00
   BP1 OFF 24:00
```

To obtain continuous operation only the first timeslot for use needs to be configured, leaving the other two unchanged.

Monday

Timeslot 1 Start at 06:00 >>>> Stop at 24:00.

If you don't really want the compressor to stop at 24:00 you must enter the start time for the following day at "00:00", otherwise the compressor will stop at midnight.

```
② F1 ON 00:00
   BP1 OFF 17:00
```

Tuesday

Timeslot 1 Start at 00:00 >>>> Stop at 17:00.

ATTENTION: The operating pressure band must be set as in the previous timeslot, otherwise the compressor will follow the new operating pressures configured in the selected band.

Maestro XB can be programmed to use the compressor with different pressure values during daily or weekly use, thereby making compressor use even more flexible.

To take advantage of this possibility you must first program the pressure bands in the [User] menu. These can then be recalled via time scheduling.

```
① F1 ON 06:00
   BP1 OFF 12:00
```

As already mentioned, the compressor operating pressures can be varied simply by recalling them based on the times.

In the first operating timeslot we can tell Maestro XB to start at 6:00 in the morning until 12:00 using the BP1 pressure band (E.g.: Pmin= 6.5 bar Pmax 7.7 bar).

```
① F2 ON 12:00
   BP2 OFF 23:00
```

In the second timeslot, on the other hand, we want to use different operating pressures, set the compressor start time (12:00) and stop time (23:00).

Then select the pressure band with the desired operating pressures (BP2: Pmin= 6.0 bar PMax=7.2 bar).

```
② F1 ON 06:00
   BP3 OFF 23:00
```

Whereas, on the next day we can use our compressor for the entire day at a third operating pressure band.

(E.g. BP3: Pmin= 6.2 bar PMax=7.6 bar).

Up to 3 Pressure bands can be set.

Combining two task just described, compressor flexibility can be increased.

① F1 ON 06:00
BP1 OFF 24:00

This example provides a different possibility of time scheduling.

② F1 ON 00:00
BP1 OFF 08:00

The compressor is started at 6:00 on Monday using the BP1 band operating pressures.

② F2 ON 08:00
BP2 OFF 18:00

At 8:00 on Tuesday the compressor will stop using the BP1 band operating pressures and switch to timeslot 2 where it will use the BP2 band operating pressures until 18:00.

② F2 ON 18:00
BP1 OFF 24:00

It will then go back to using the BP1 band operating pressures from 18:00 until 8:00 on Wednesday.

③ F1 ON 00:00
BP1 OFF 08:00

7.5 Checking the times inserted

Maestro XB has a control system for entering the start and stop times. When a start time is entered it is automatically listed as the stop time. The purpose of this measure is to prevent stop times being entered which are previous to the start times.

① F1 ON 00:00
BP1 OFF 00:00

When scheduling begins as indicated above, the start hours begin to flash, indicating that their values can be set.

① F1 ON 08:00
BP1 OFF 08:00

After entering the start hour and moving the cursor to enter the start minutes, you will note that the stop hours take on the same value as the start hours.

① F1 ON 08:30
BP1 OFF 08:30

The same control is carried out on the value entered for start minutes

① F1 ON 08:30
BP1 OFF 12:30

After modifying the stop hour the stop minutes must be entered.

① F1 ON 08:30
BP1 OFF 12:00

Then, if the data entered is congruent, the cursor will move to the operating pressure band selection.

This type of entered data check helps to streamline scheduling, at the same time preventing invalid times from being entered.



Attention: The above check does not exonerate the operator from paying attention to the coherence of the entered times.

THE HOUR COUNTERS

Maestro XB has a series of hour counters which, in addition to determining the hours of operation, also manage the maintenance intervals on the compressor wear parts.

For this purpose there are two types of hour counters:

- Operating hours counter,
- Maintenance hours counter.

The task of the former is to inform the user on the compressor hours of operation, while the latter is to advise the user that a predetermined operating period has expired and that a maintenance operation is required.

8.1 Operating hours counter

Maestro XB provides the user with 3 types of hour counters with different modes of operation.

Unlike the maintenance counters, these cannot be modified by the user.

The following are the compressor operating hours counters:

- Enabled hours counter,
- Running hours counter,
- Load hours counter.

8.1.1 Enabled hours counter

The "Enabled" hours counter indicates for how many hours the compressor has been enabled, or made available for operation. This hour counter also takes into consideration periods in which the compressor is not on because it is stopped in the work cycle.

8.1.2 Running hours counter

The "Running" hours counter indicates how many hours the compressor is running. The Machine maintenance hours counter is associated with this hour counter.

8.1.3 Load hours counter

The "Load" hours counter indicates how many hours the compressor has operated under load.

8.2 Scheduled Maintenance Intervals

The purpose of the maintenance hours counter is to advise the user that maintenance is required on the compressor parts subject to wear in order to ensure correct operation.

```
1.0 User
1.3 Service
```

Enter the [**User**] menu and select the [**Service**] sub-menu to access the maintenance interval settings page.

```
Oil change:
      5000h
```

The first two screens allow you to set the maintenance intervals for:

- Compressor oil,
- Air/oil separator filter.

```
Separ. Change:
      10000h
```

```
Oil change:
      5000h
```

The subsequent screens display the hours accumulated from the above described hour counters.

```
Separ. Change:
      10000h
```

When one of the timers reaches the prescribed maintenance hours a warning signal appears on the display (see alarms signalling) to advise that maintenance is required on an element (i.e. change the oil). As we will see later, this warning can be removed only with a password which, if correct, in addition to removing the warning will also reset the relative hour counter for the next count.

8.2.1 Changing the Timer

Enter the [**1.3 Service**] menu to set the desired maintenance interval, always referring to the indications from Mattei.

For example, if we want to change the value of the “Oil Change” timer from 5000 hours to 4500 hours, first we must access the [**1.3 Service**] menu.

```
Oil change:
      5000h
```

Then press the < ↵ > button. The value will begin to flash. Then use the < ↓ > button to modify the value, decreasing it. Once the desired value is reached press the < ↵ > button again.

```
Oil change:
      5000h
```

Once the desired value is entered, press the < ↓ > button to view the next hour counter.

8.3 Maintenance Warning

When one of the hour counters reaches the predetermined number of hours it provides the user with a visual instruction to carry out the relative maintenance (e.g. Oil).

```
Load    6.7bar
Oil change Oil
```

As indicated in paragraph 3, scrolling text appears on the display which describes the fault type which has occurred.

To eliminate the maintenance warning a password must be entered (see password management) in order to prevent erroneous deletion.

Press <Reset> to view the page which requests the password to cancel the fault warning and automatically reset the hour counter.

The warning can be eliminated only by entering this password, otherwise it will be repeated until the password is entered.

Maestro XB is capable of managing an air dryer mounted on board the machine. This is activated at the first start-up of the compressor and is kept active until the following conditions occur:

- The compressor is stopped with the "STOP" button or similar commands (Clock, remote stop).
- The dew point drops below the value set in the "Stop point" item for a delay time (default 60").
- The compressor stops in the automatic cycle (only if the Automatic operation option is selected for the dryer).

If the dryer temperature goes out of the predetermined range for normal operation the compressor may or may not be stopped depending on the setting (alarm/block) selected.

The selection can be carried out only by authorised personnel.



Attention: Remember that the expansion module must be installed in order to access the dryer management menu and the function must be enabled from the relative menu.

9.1 Operation

When the compressor is enabled the dryer unit is also activated.

The alarms are inserted with a delay that can be modified in order to give the dryer time to bring the dew point temperature within the operating range ($T_r < 6^\circ\text{C}$).

Once this delay has expired the alarms become active and the dew point control is activated.

If we suppose that we have selected "**Alarm**" mode in order not to stop the compressor, if the temperature is within the set "Stop point" and $+6^\circ\text{C}$ no warning will be displayed, but the following fault warnings will be signalled:

- "High Dew Point" if the dryer temperature exceeds the maximum values. This indicates that the dryer has stopped and cannot adequately cool the air.
- "Ice Alarm" if the dryer temperature drops below the stop value. This indicates that the ambient temperature where the compressor is located may be too low. In this case Maestro XB, after a time delay (usually 60") will stop the refrigeration unit. The dryer unit will be restarted when the dew point is greater than the set "Start-up point".

In both cases the warnings are self-resetting when the temperature returns within the predetermined range for operation and the warning is removed.



Attention: The fault indication is immediate, but the dryer unit or compressor arrest takes place after the set delay.

REMOTE CONTROLS

Chapter 10

Maestro XB allows some functions to be remotely controlled having to do with compressor management and status, specifically enabling and disabling, fault signalling, etc.

10.1 Remote enabling

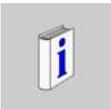
Usually the compressor is enabled or disabled with the <**On/Off**> button on the keyboard. However, the compressor can be enabled by means of a digital contact from a facility other than the one where the compressor is located.

This function can be activated by authorised Mattei personnel, therefore it must be requested during installation. This allows the compressor to be enabled through a simple digital contact, allowing it to be placed in locations with poor accessibility.

Maestro XB interprets the state of the contact as follows:

Contact Open = Compressor Not Enabled,
Contact Closed = Compressor Enabled.

In order to remotely enable the compressor it must first be enabled from the on board keyboard (On/Off button): only if this operation is carried out the remote command works. If enabling is not carried out, closing the remote contact will have no effect on the compressor.



ATTENTION: When the "Check Pressure Switch" option is activated, the remote control option will no longer be available.



Remember that enabling the compressor does not mean starting the compressor. Starting is subordinate to the line pressure value detected by the on board probe. If this pressure is within the "Minimum pressure" and "Maximum pressure" the compressor will NOT be started, but will go into STAND-BY mode.

10.2 Remote signalling

Sometimes it may be necessary to "remotely send" some informations relative to compressor operation. It is possible to view the following machine status signals remotely:

- Compressor in lock status,
- Compressor running.

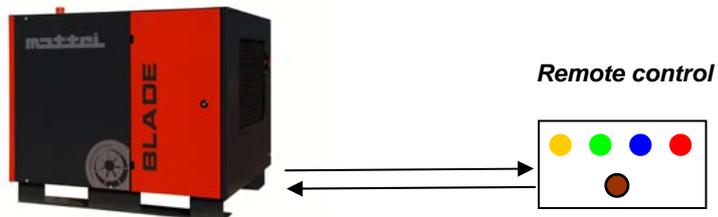
Some of the signals indicated above are obtained directly from the board as well as from the electrical panel. The only characteristics in common is that the digital contacts are not powered.

Specifically, the signals from the board are:

- Compressor enabled (only if expansion board P/N **AC40B24983** is installed).

In order to obtain correct operation of the system the following parameters must be observed:

- Maximum applied voltage **240 Vac 48 Vdc**,
- Maximum applied load **2 A** resistance.



On some models these signals are already present by default since the expansion is already installed by Mattei. This information can be found directly on the electrical wiring diagram provided with the compressor.

A compressor managed by Maestro XB can be connected to higher network management devices (e.g. Multicomp II, etc.). This type of connection allows networks to be realised between different compressors which are of different brands and control types, such as electro-mechanical command compressors and compressors with electronic boards. The start command takes place through the closing of a digital contact, while opening triggers the vacuum and subsequent arrest of the compressor.

Control:
Pressure switch

In order to obtain this type of operation, you must enter the [User\configuration] menu and then go to Control, usually set to "Pressure probe", and modify it to "Pressure Switch". Then enable the machine using the On/Off button.

Once enabled, the control unit checks the status of the digital input to which the external control device is connected (pressure switch or Multicomp II, etc.). If the contact is open the compressor remains in stand-by, otherwise, if it is closed, the compressor is started.

If the higher controller goes into fault condition this will stop the compressor. To restart it the control at "Pressure Probe" must be reset.

11.1 Higher controller check

It is possible to make it so that if the higher controller goes into fault condition the compressor returns automatically to the "automatic" operating mode. This prevents the compressor from being excluded from operation if the higher device goes into fault status and opens the management contacts.

Check PressSt:
YES

For this purpose use the "Pressure switch check" option in the [Advanced] menu. This function carries out a check on the digital contact usually tasked with the "remote control" function. If the contact is closed, Maestro XB waits for the commands coming from the higher controller, otherwise, if it is open for more than 5 seconds control returns automatically to "Pressure Probe", thereby ensuring the operational continuity of the compressor.

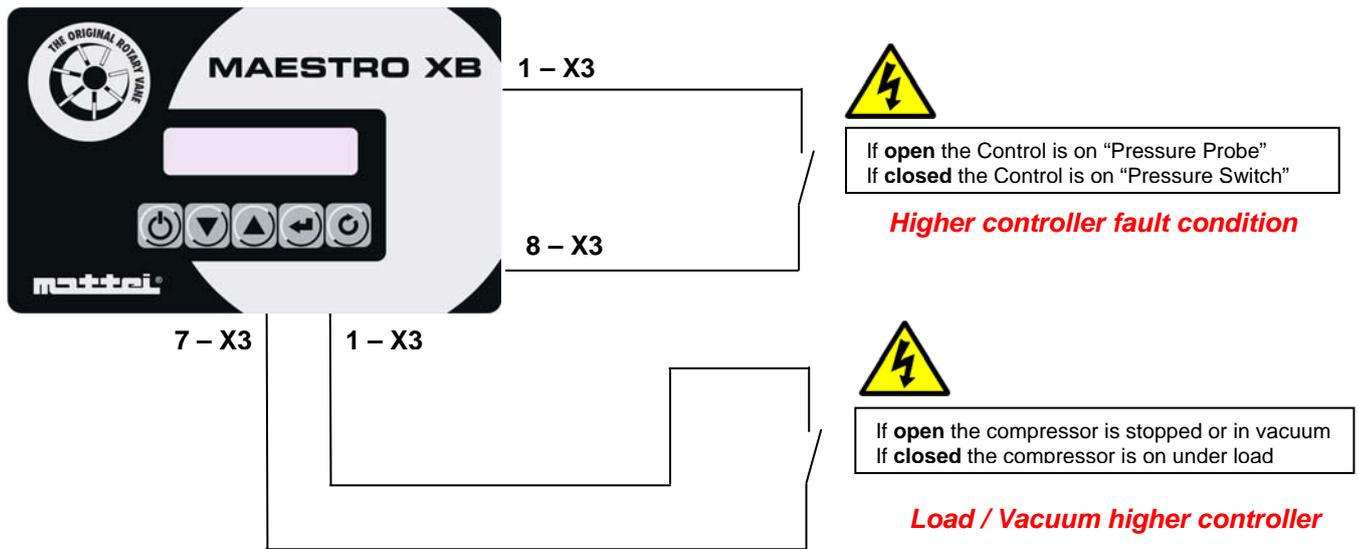
The contact that informs the Maestro XB that the external controller is in fault condition must be voltage-free and must come from a specific signal if available, or through a relay that signals the lack of voltage.

On the next page we will provide an indication of how the connection should be carried out if you want to use this additional function.



ATTENTION: If the input pressure switch check function is enabled "Remote control" can no longer be used. If

Wiring diagram for connection with a superior controller.



For standard connection to a pressure switch connect a normally open (N.O.) voltage-free contact to the clamps which are part of this function (see electrical diagram supplied with the machine). Whereas, to conduct a fault control of the external device, connect a normally open (N.O.) voltage-free contact to the clamps which are part of this function (see electrical diagram supplied with the machine). This contact must be closed when controller is in normal condition and open in case of fault. If the higher control device should go into fault condition, opening the above mentioned contact will restore the compressor to operation using the on board pressure probe and as references (Pmin and Pmax) it uses the on board ones.



The "⚡" icon will be displayed on the screen indicating that compressor is not managed by the external controller.

The switch takes place without stopping the compressor. There will be a switch through vacuum condition to then go to control by the probe. To automatically return operation to pressure switch mode simply restore the controller.



In all the indications we refer to the Maestro XB terminal block. Actually this is in a terminal block in the electrical cabinet, and therefore the connections which need to be carried out must be verified against the electrical diagram supplied with the compressor.

In the presence of two or more compressors in a system, you may need to have the production compressor rotate independently. Maestro XB is able to manage a small network made up of a maximum of 4 compressors, allowing a compressor to rotate daily, weekly or monthly. Also, if the production compressor should lock up due to fault, the next compressor would be started in order to compensate for the lack of air, thereby ensuring air supply to the network.

12.1 Installation

Before physically proceeding with connection of the compressors, you must:

- Install the expansion module on board of the main board (See chapter 2) of the compressor to which you want to assign the Master function (it does not need to be installed on all the compressors).
- Assign the physical communication address.

To assign logical addresses to each compressor in order to carry out this activity you will need to access the “Advanced \ configuration” menu.

```
Modbus active:
                NO
```

Select the protocol enabling item and change the selection from NO to YES.

```
Address:
                1
```

Assign the network address, taking care not to enter an address which has already been assigned.

```
Speed:
Baud:          19200
```

Check the communication speed (the standard value is 19200 baud).

ATTENTION: The Master compressor must have the following settings:

1. The expansion board must be installed;
2. ModBus must be active;
3. The assigned address must be 1.

Only on the Master the “User” menu will contain the page that allows us to select the number of compressors connected and the desired type of rotation to be used.

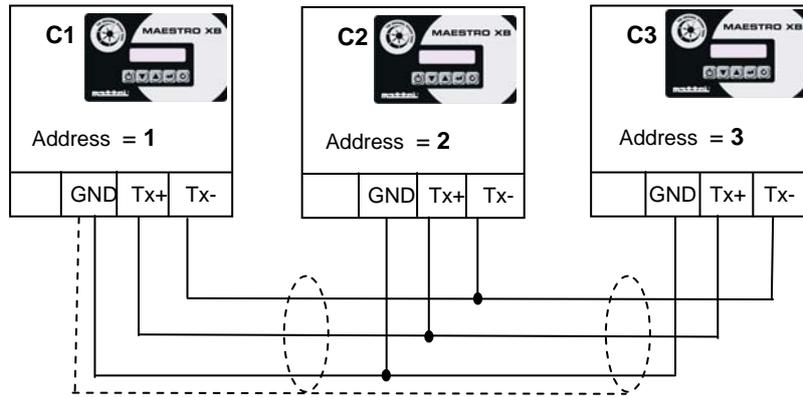
For “Slave” compressors instead, after the Modbus enabling (setting addresses other than 1), it's necessary enter the menu “User \ Network” and then enable “Slave” function.



Caution: in “Multiple” mode, VSD compressors CANNOT be included. Compressor with inverter can be used only in “Single” mode.



Once the network addresses and the role of Master are assigned, proceed with physical connection of the compressors using a shielded 3*1mm² cable, completing the connections indicated below.



We recommend carrying out cable connection activity without power or after temporarily disabling the ModBus mode, reactivating it once connections have been completed.

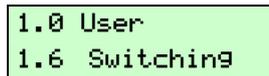


The connector is physically located in the left hand corner of the board (see adjacent photo).

In the electrical panels of latest production these connection points are remoted on the main terminal block, making easier the cabling between compressors.

12.2 Preliminary operations

Once the electrical connections have been carried out, go to the Master compressor and activate the weekly scheduling. Carry out the desired scheduling (see Clock chapter); in the "User" menu a selection item will be added, specifically you will see the item "1.6 Rotation".

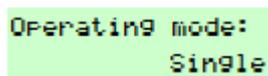


This menu item is displayed only if the control unit is configured as Master, otherwise these items will not be displayed because they are not required for normal use of the machine.

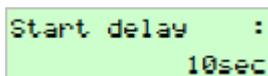


Once you are in the menu the first selection you should make is the compressor rotation frequency. This can be:

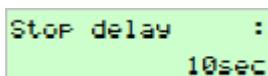
- Daily,
- Weekly,
- Monthly.



Define now the operating mode of the network.



If Multiple mode has been selected, Start delay between compressors must be considered.



After, also Stop delay for each compressor must be set.



After the compressor setting, an icon indicating if compressor is configured as "Master" or "Slave" will be displayed.

At this point, "Slave" compressors in the network can be enabled and made available. Then also "Master" compressor can be enabled.

12.3 Operating mode

The network provides two operating modes that allow to optimize the compressor use. These differ in the compressor management, so a proper evaluation of the real needs of customer is necessary.

Possible operating mode are described below:

1. Single operating mode
2. Multiple operating mode

12.3.1 "Single" operating mode

This option requires that installed units would have same or similar deliveries .

With just one single unit enabled, any other unit will be started depending by pressure drops, except than for unit fault.

12.3.2 "Multiple" operating mode

This option provides a further compressor start if working pressure should drop down below P_{min} , until a proper pressure level would be reached.

12.4 Programmable units Turnover

For both (single/multiple) modes an automatic switching among units to indentify "base" one. Switching can be selected as :

- No switching
- Daily
- Weekly
- Monthly

By the above options, user can balance working time between installed units and eventually manage for a backup unit if some fault occurs. Next an example for daily switching:

Once the network is enabled, the unit C1 will be selected as a "base" on Monday. On Tuesday midnight the unit C2 will become the "base" and etc etc following days, with C3 and than back to C1.

Monday



Tuesday



12.4.1 Operation only with programmed rotation

This mode allows rotation of the compressor being used when the network is started manually by an operator or used 24 hours a day. The Master independently starts up the next compressor and stops the outgoing one, following the desired frequency.

The mentioned mode does not require the use of the clock and in the event that some of the compressors have it you must ensure that the function is disabled.

12.4.2 Operation with clock and scheduled rotation operation

It is possible to combine scheduled rotation with weekly scheduling. This makes it possible to obtain compressor rotation even for those customers who have clearly defined times of use.

12.5 Faults management

The use of only one compressor to cover the line demands requires excellent maintenance in order to prevent any operational faults which may lead to a lack of air production. Despite this, there is always a possibility of faults on the compressor which is destined for production on a given day. Maestro XB recognises this fault and takes steps in the least possible time to compensate for the lack of the compressor, starting the next one and thereby limiting the inconvenience caused by the stoppage of the primary compressor.

When the compressor which is in fault condition is restored, use the On button to re-enable it. The compressor will be started and will resume normal operations, while the replacement compressor will be stopped.

To better understand how the network performs, let's suppose that we have a network comprised as follows:

- Compressors present : 3,
- Scheduled rotation : Weekly,
- Day of the week : Tuesday,
- Production compressor : C2.

Now, if during the day on Tuesday a fault occurs on the production compressor configured as Master, Maestro XB will start the next compressor, that is, compressor C3 (see red arrow).



When the compressor that was in fault condition is available again, it will be started to resume its production operation (see blue arrow), while the replacement compressor will be stopped to await the scheduled rotation which makes it the production compressor.

12.6 Power outage

For correct network operation we recommend not removing power from the compressors unless required for maintenance. However, during normal operation power outages may occur. The master compressor memorises the production compressor so that it can restart the same compressor that was in operation. If this occurs, remember that the various compressors must be re-enabled manually or the restart after blackout function must be enabled, but remember that this condition must be pointed out clearly through special signalling and the customer must sign a release.

SUPERVISION

Chapter 13

As mentioned in the previous chapter, Maestro XB allows remote control to be conducted through the use of a PC capable of conducting local monitoring.

The advantages of supervision are:

- ✓ Local or remote monitoring of one or more compressors.
- ✓ Signalling of any faults to service via the Internet or telephone.
- ✓ Verification and analysis of the faults which have occurred.

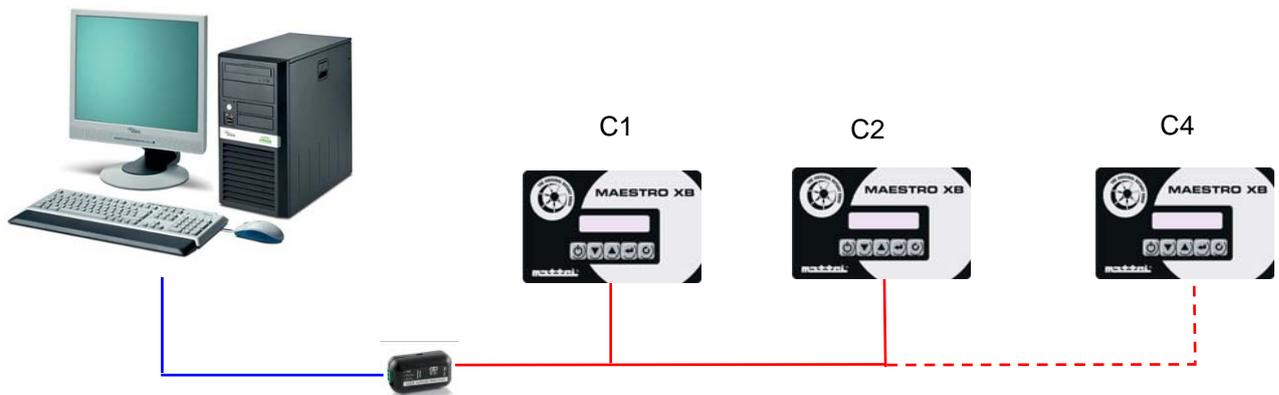
All of this information depends on the software which will then be realised. Remember that Mattei **does not supply** any supervision software.



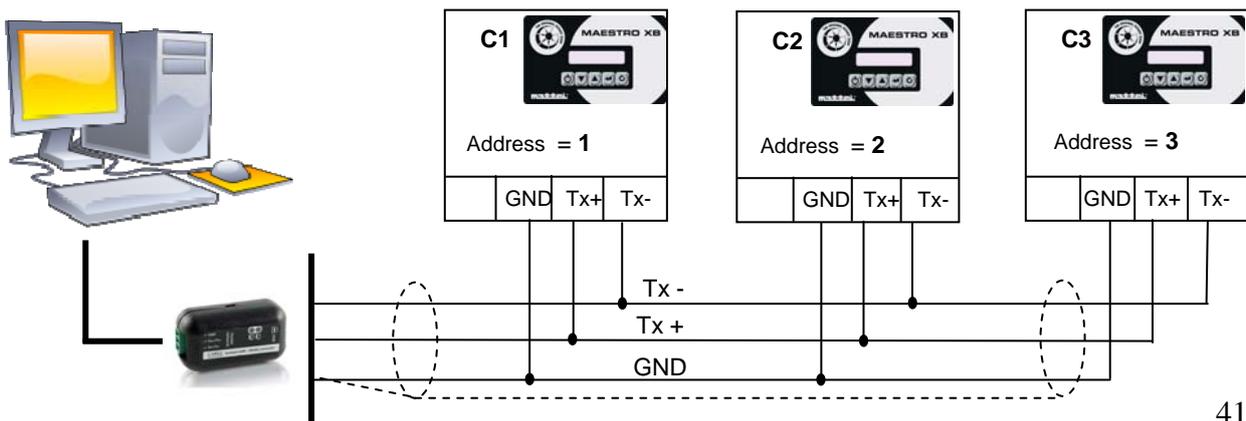
If a compressor network is built (see specific chapter) supervision will not be possible because the compressor configured as Master will use the serial port to communicate with the connected compressors, thereby preventing the possibility of accessing it with any supervision software.

13.1 Electrical connections

Maestro XB has an RS 485 serial port which is part of a 3-way connector. The monitoring computer will need to be connected here to the other compressors which are to be monitored. To connect to the PC a converter is needed which converts the RS 485 signal coming from the field into the RS 485 or USB protocol suitable for communication with the PC. Below is a simple graphic representation for connection of the compressors for system supervision.



Once the connections are made it will be possible to monitor and configure the compressors via a PC. Remember that the software is a customer's responsibility. Mattei supplies a list of variables which are transmitted so that a programmer can access and manage the compressor.



For the electrical connection use specific 2 wire cables with shielding for serial communication. Mattei does not supply signal converters.

13.2 ModBus Protocol

This is the most widespread communication protocol in the computer monitoring field. If the user does not intend to use the software supplied by Mattei, he can create his own management software.

The only limitation that Mattei imposes is that only those variables required for monitoring and for modifying only the parameters in the user accessible menus will be provided, thereby preventing access to the other variables. This is to prevent modifications unauthorised by Mattei which could lead to compressor malfunction.



ATTENTION: Modification of these parameters via software is not permitted by Mattei and therefore any variations of these variables will immediately void the compressor warranty.

13.3 Serial configuration

Before starting network monitoring the serial protocol configuration must be enabled. Without this operation the control units will be isolated from the supervision system.

```
Modbus active:
                NO
```

To activate communication go to the [Advanced\Configuration] menu and select the screen shown here.

```
Modbus active:
                SI
```

Once the ModBus protocol is enabled the following 2 pages will be displayed which define the communication parameters.

```
Address:
                1
```

Assigning the address for data interrogation is essential. Do not place two compressors on the same network with the same address. This would cause a malfunction of the entire network. We recommend carrying out this operation before physically connecting the compressors to one another since the default address for all the Maestro XB control units is 1.

```
Speed:
Baud:          19200
```

The communication speed is usually set to 19200 baud.

After configuring all the compressors present they can be connected to the serial converter which will manage communication with the PC, providing all data relative to the connected compressors.

For further clarification, please see the specific reference manual where all the operations that should be carried out are indicated, as well as the variables which can be managed over this protocol.



ATTENTION: For supervision of machines that have the clock, remember NOT to enable "rotation" because this function is valid only for operation in "Network" mode and it would cause a loss of the connection with the PC where the monitoring software is installed.

This chapter provides a description of possible Maestro XB malfunctions. They are subdivided into:

- General faults
- Faults connected to the dryer

For each category the potential problems which may be found are listed along with possible causes and possible remedies to correct the malfunction on site without having to replace the electronics since the malfunction may be caused by problems which do not depend on them.

In general we recommend always to verify that the compressor is correctly powered and that the mains voltage falls within the compressor's rated values, otherwise malfunctions may occur which would not be found with correct power supply voltage.



Attention: We recommend expressly avoiding any manoeuvres on the live electrical panel if not specifically trained to operate in these conditions. If possible, carry out verification operations in the complete absence of power supply voltage in order to prevent electrocution.

14.1 Generic problems

The term “generic problems” refers to any faults which may occur in compressors from any compressor family without distinction.

Problem	Cause	Remedy
Maestro XB does not switch on	There is no power supply voltage.	Verify that there is mains voltage. Verify that there are 24Vac on the transformer.
	Fuse blown.	Replace the fuse.
	Defective connections to terminal block.	Check the terminal block connections.
	Door opening protection relay defective.	Replace relay.
	Missing program.	Load the program (only Mattei personnel).
	Video terminal defective.	Replace video terminal.
The compressor does not start when “On” is pressed	Defective pressure probes.	Replace the pressure probe
	Probe operating range different than what is set in the control unit.	Set the correct operating range in the “Debug” menu (only Mattei personnel).
	Pressure probe incorrectly connected.	Check the probe connections.
	Faulty probes.	Replace the probes.
	Oil temperature too low.	Check the oil temperature and wait for it to rise.
Incorrect pressure values	Inaccurate values.	Modify the probe offset in the “Debug” menu (only Mattei personnel).
	Faulty pressure probe	Replace the probe.
	Probe operating range different than what is set in the control unit.	Set the correct operating range in the “Debug” menu (only Mattei personnel).
Incorrect Temperature Values	Faulty probe.	Replace the probe
	Probe is a different type than NTC.	Replace it with a correct probe.

14.2 Dryer malfunctions

These malfunctions are closely tied to the installation and use of compressors equipped with dryers.

Problem	Cause	Remedy
The dew point does not drop to within operational values	The dryer fuses are blown.	Replace the dryer fuses.
	The dryer compressor does not work.	Check for power supply voltage to the dryer.
	The dryer fans do not work.	Call Mattei technical support service.
	The refrigerant system is not adequate for the capacity produced.	Call Mattei technical support service
	One of the dryer protection devices has been triggered.	Check the protection devices, referring to the dryer manual.
	Intervention of electrical protection of dryer.	Wait for automatic rearming.
The dew point drops below 0°C	The dryer compressor is not stopped.	Check the Maestro XB commands.
		The command contactor is locked in closing.
	The mechanical throttle valve is locked.	Call Mattei technical support service



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ES: <http://tinyurl.com/XBmaestro-E>

