



# MAESTRO <sup>XS</sup>

USER'S MANUAL  
TECA2G-007

Ing. Enea Mattei S.p.A. reserves the right to modify the product, instructions and information contained in this manual at any time without any obligation to update previously supplied goods.

### **Assistance and Spare parts**

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GENERAL .....	4
1.0 Introduction .....	4
1.1 Identification codes .....	4
VIDEO TERMINAL AND KEYPAD .....	5
ENABLING THE COMPRESSOR .....	7
3.1 ENTERING THE CODE .....	7
OPERATING MODES .....	8
4.1 CONTINUOUS mode .....	9
4.2 AUTOMATIC mode (factory setting) .....	9
4.3 MODULATION mode .....	9
4.4 OPTIMA version .....	10
MENU STRUCTURE .....	11
5.1 [ MONITOR ] menu .....	15
5.2 [ MAIN ] menu .....	17
5.3 [ USER ] menu .....	17
5.5 [ CLOCK ] menu .....	19
5.6 [ HISTORICAL ] menu .....	21
5.7 [ NETWORK ] menu .....	22
HISTORICAL .....	24
6.1 Events submenu .....	24
6.1.1 Alarm mode .....	24
6.1.2 Block mode .....	24
6.1.3 Event messages .....	25
6.1.4 Saved event messages .....	26
6.2 Video connection management .....	29
6.3 Modifications submenu .....	29
6.4 Start-ups submenu .....	30
PASSWORD MANAGEMENT .....	31
7.1 USER password .....	31
WEEKLY PROGRAMMING .....	32
8.1 Enabling programming .....	32
8.2 5-day programming .....	33
8.3 7-day programming .....	34
8.4 Disabling weekly programming .....	34
8.5 Special programming .....	35
8.6 Programming a network .....	35
8.7 Checking entered times .....	36
HOUR COUNTERS .....	38
9.1 Operating hour counters .....	38
9.1.1 Enable hour counter .....	39
9.1.2 Run hour counter .....	39
9.1.3 Load hour counter .....	39
9.2 Scheduled maintenance frequencies .....	39
9.2.1 Modifying Timers .....	40
9.3 Maintenance Signal .....	41
REMOTE CONTROLS .....	42
10.1 Remote enable .....	42
10.2 Remote signalling .....	44
TROUBLESHOOTING .....	45
11.1 Generic problems .....	46
11.2 Dryer malfunctions .....	47
11.3 Inverter malfunctions .....	47

## 1.0 Introduction

This manual has been written for customers who wish to learn more about how the “**MAESTRO<sup>XS</sup>**” electronic board works.

The manual provides information on HW and SW characteristics and operating methods.

**MAESTRO<sup>XS</sup>** 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 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. Stopping and starting can be programmed according to a weekly schedule and combined with the management of connections to other compressors in order to control multiple installations as efficiently as possible.

## 1.1 Identification codes

MAESTRO<sup>XS</sup> comprises various hardware devices, each of which is identified by a code.

These codes are:

Code	Description
<b>AC40C23975</b>	Basic control module.
<b>AC40C23976</b>	Expansion module.
<b>AC40C23979</b>	Video terminal.
<b>AC40C23981</b>	Serial communication board.

**Table 1**

These codes univocally identify the elements comprising the control device. Just the expansion module requires care during configuration as it must be addressed before use.

# VIDEO TERMINAL AND KEYPAD

## Chapter 2

MAESTRO<sup>XS</sup> is fitted with a terminal which acts as a user interface, providing information on the status of the compressor and allowing the various management parameters to be programmed.

### Video terminal

- this is a one-colour semi-graphic interface with a video resolution of 132 x 64 pixels.

As will be described later on in this manual, the upper part of the pages usually contains a heading while the lower part contains more detailed information.



Fig. 1

### Keypad

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



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



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



**On / Off button:** Enables and disables the compressor.



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



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



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

**Technical specifications**

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

Table 2

**Overall dimensions**

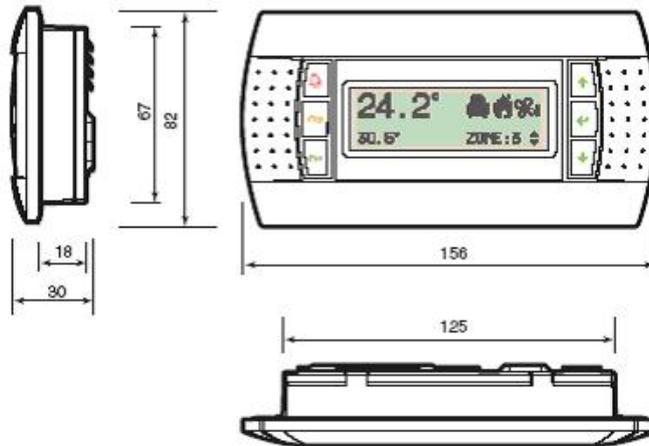


Fig. 2

# ENABLING THE COMPRESSOR

Upon delivery, the compressor is protected by an alphanumeric 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 in Figure 3 appears with the cursor flashing in the top left-hand corner.



Fig. 3

## 3.1 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<sup>xs</sup> 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.

## OPERATING MODES

MAESTRO<sup>XS</sup> 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.

A fourth mode, OPTIMA, is available if an inverter is installed.

Figure 4 below illustrates the various available options. The compressor is factory set to AUTOMATIC.

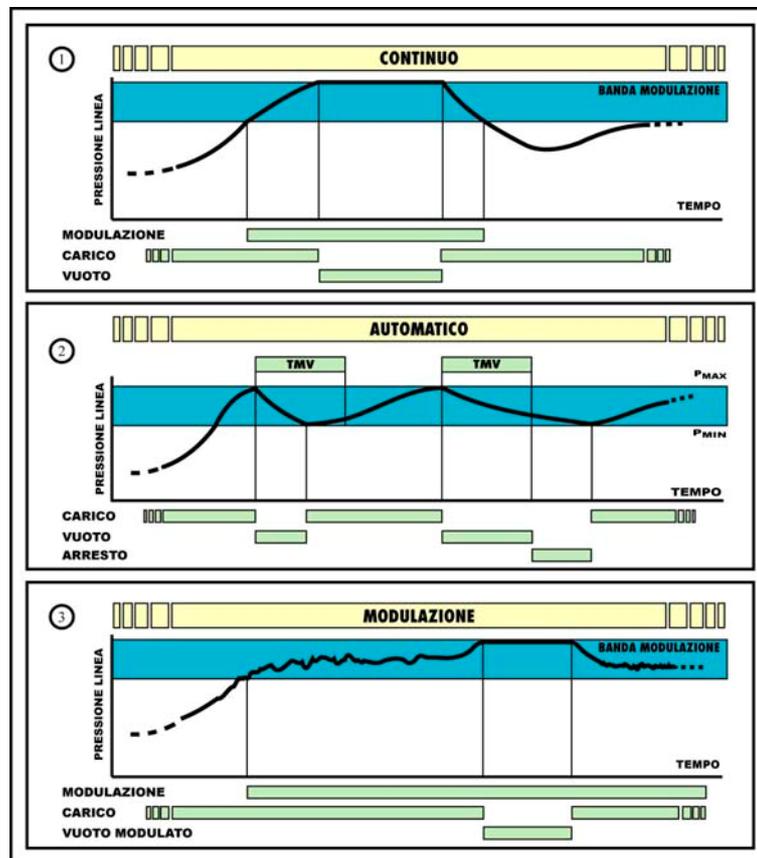


Fig. 4

## 4.1 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.

## 4.2 AUTOMATIC mode (factory setting)

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.

## 4.3 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 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.

## 4.4 OPTIMA version

The OPTIMA version, fitted with an INVERTER, is currently the most flexible product in the MATTEI range of industrial compressors.

Generally, speaking, air requirements in a user network are not constant but vary continuously. These variations occur for many reasons, such as different usage, maintenance and reprogramming frequencies, underuse and/or overuse caused by different production cycles and work shifts.

All these factors lead to variable air requirements which OPTIMA is able to satisfy thanks to its elevated operating flexibility.

OPTIMA varies its speed of rotation in order to adjust air flow to effective requirements.

To achieve this, OPTIMA is fitted with pressure sensors which constantly measure delivery air pressure and, consequently, line pressure.

The compressor can be used in two different ways in order to optimise performance according to demand:

- a) **DEAD ZONE** mode  
this mode operates as described in the previous paragraphs; the user selects an operating range by setting Pmin and Pmax.  
The control unit adjusts speed to keep operating pressure between the two limits.
- b) **PID ZONE** mode  
the user sets just one pressure value and the control unit adjusts speed to keep as close to it as possible.

Some features apply to both modes.

The first is that the top speed is closely connected with maximum pressure.

This makes it possible to optimise compressor consumption and prevent the motor from overloading.

The second is that once the no-load condition has been reached and the no-load run time has terminated, the compressor only stops if the oil temperature exceeds the set value.

The third is that line pressure is controlled in order to prevent it from exceeding Pmax over a certain delta. If the compressor is installed on a system with incorrectly sized tanks, the inverter may not be able to decelerate rapidly and thus allow line pressure to exceed Pmax. Consequently, the compressor reverts to the no-load condition after a certain period of time, regardless of its operating speed.

## MENU STRUCTURE

## Chapter

## 5

In order to communicate with the user, MAESTRO<sup>xs</sup> features various 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
Historical Menu	Yes	No	4
Network Menu	Yes	No	5
Info Menu	Yes	No	6

**Table 3**

N.B.

From now on, menus and submenus will be identified by texts surrounded by square brackets [ ], while individual page items will be identified by texts surrounded by inverted commas “ ”

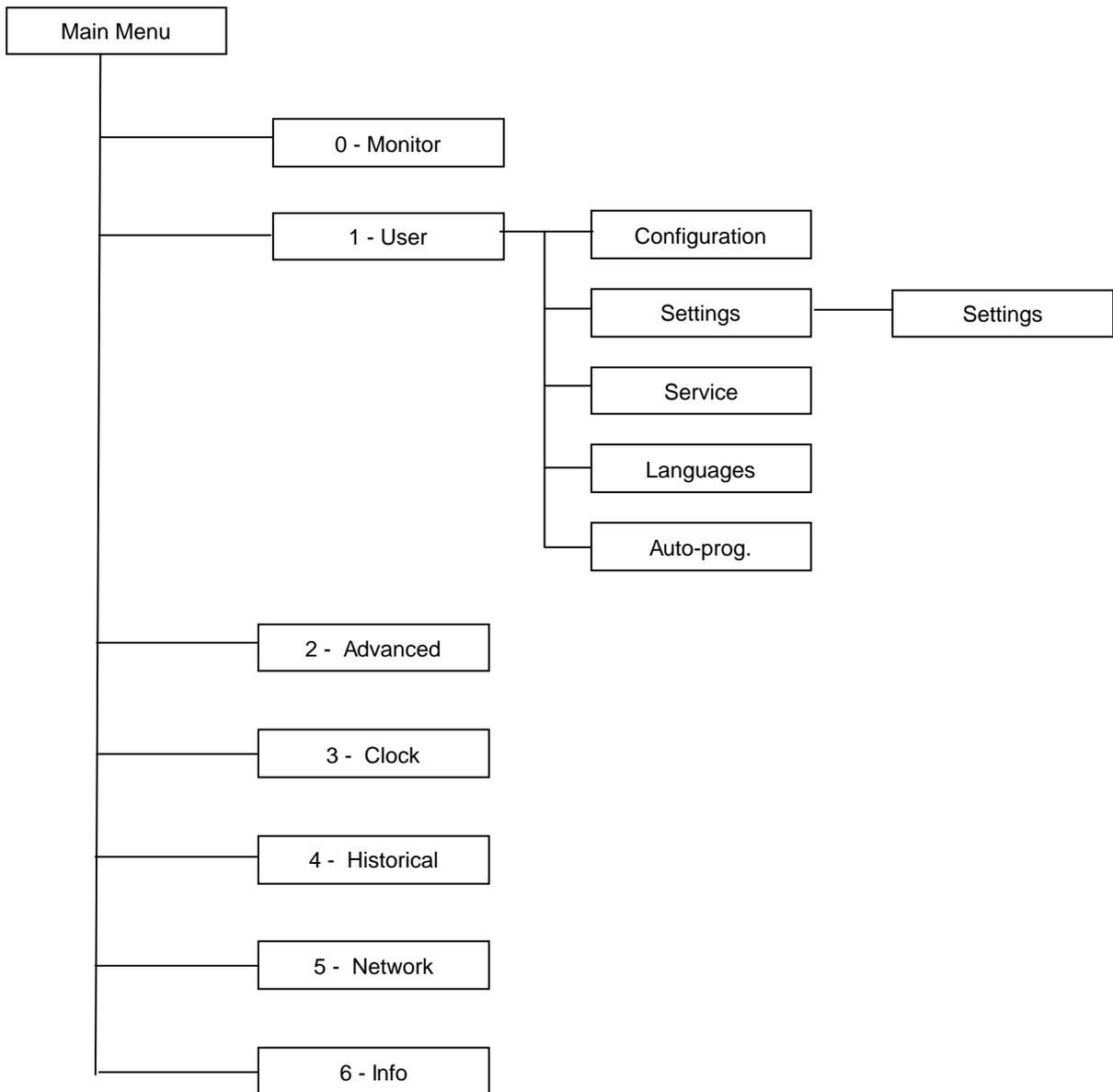
To simplify use of the compressor, some symbols are used to graphically represent certain functions, such as machine status and other settings.

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.

Apart from [ Monitor ], each menu is divided into submenus which are described below.

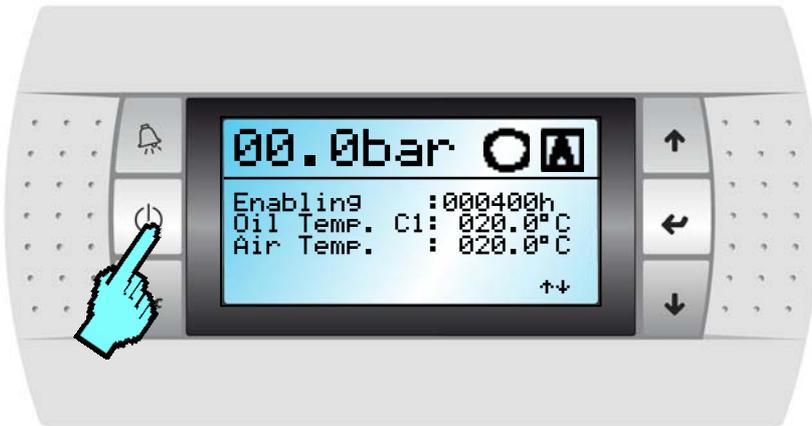


Let us now see how to move between the menus, assuming we wish to modify the maximum pressure of the system.

The other programme parameters can be changed in the same way, provided the user is authorised to do so.



When the device is powered it automatically opens the [Monitor] menu.



Press <Esc> in the [Monitor] menu.

```
0.0 Monitor
1.0 User
2.0 Advanced
3.0 Clock
4.0 historical
5.0 Lan
6.0 Info
```

The [Main] menu page appears listing all the menus of the control software. As the maximum pressure value to modify is in the [User/Settings] menu, press <↓> to move the cursor to the [User] menu.

```
0.0 Monitor
1.0 User
2.0 Advanced
3.0 Clock
4.0 historical
5.0 Lan
6.0 Info
```

After selecting the required menu, press <↵> to open it.

```
1.0 User
1.1 Configuration
1.2 Settings
1.3 Service
1.4 Languages
1.5 Self programming.
```

The [User] menu comprises various submenus grouping the system variables according to their function.

Select the [Settings] submenu which contains the variable to modify. To do this, perform the operations described above.

```
1.2.1 Settings
Maximum Pressure:
      007.7bar
Minimum Pressure:
      006.7bar
Off-load Running Time:
      120sec
```

In the [1.2.1 Settings] menu, the flashing cursor is in its starting position (top left).

Press <↵> to move the cursor to the variable to modify.

Press once to select the Pmax variable, press 2 times to select the Pmin variable, and so on.

```

1.2.1 Settings
Maximum Pressure:
      ■007.7bar
Minimum Pressure:
      006.7bar
Off-load Running Time:
      120sec
    
```

Once selected, the cursor moves next to the variable to modify. Press <↓> or <↑> to decrease or increase its value.

To change it to 7.5 bar, press <↓> until "007.5bar" appears.

```

1.2.1 Settings
Maximum Pressure:
      ■007.5bar
Minimum Pressure:
      006.7bar
Off-load Running Time:
      120sec
    
```

Press <↓> to accept the change and to move the cursor to the next parameter.

```

1.2.1 Settings
Maximum Pressure:
      007.5bar
Minimum Pressure:
      ■006.7bar
Off-load Running Time:
      120sec
    
```

If no other parameters on the page require changing, press <↓> until the cursor reaches its starting position.

```

1.2.1 Settings
Maximum Pressure:
      007.7bar
Minimum Pressure:
      006.7bar
Off-load Running Time:
      120sec
    
```

Press <Esc> to exit the menu and go back one level. Press once again to return to the [Monitor] menu.

Some submenus comprise more than one page, unlike the one shown in the example. Press <↓> or <↑> to move from one page to another.



Menus comprising more than one page are identified with two arrows "↕" in the bottom right-hand corner of the pages. These menus are "cyclical".

## 5.1 [ MONITOR ] menu

The [ Monitor ] menu is the heart of the entire software application and displays the operating parameters of the compressor. It also shows the operating status, operating hours, etc..

Given the importance of the menu, if the user accesses other sections of the software for any reason and the terminal keypad is not used for a certain period of time, the system automatically reverts to the first page of the menu.

The [ Monitor ] menu is essential for controlling the machines. Consequently, MAESTRO<sup>XS</sup> moves to this page if it detects no action by the user.

The first page of the menu is shown to the side and displays the following information:



- Line pressure
- Machine Status (in chart form)
- Operating mode (in chart form)
- Compressor operating hours
- Oil temperature
- Outlet air temperature

The first page also indicates any compressor faults at the bottom of the page with a warning sign and a description of the fault.



An example of a fault message is shown to the side where, together with an indication of the typology, the user is also informed that the compressor is "BLOCKED".

The text can be scrolled in order to show the full description of the fault typology.

The following tables show descriptions of the icons displaying machine status and the compressor operating mode.

Machine status	
	Compressor Disabled
	Compressor Enabled in Stand - By
	Compressor no-load
	Compressor charging
	Compressor blocked

Table 4

Operating mode	
	"AUTOMATIC"
	"CONTINUOUS"
	"MODULATION"
	"OPTIMA"

Table 5

Continuing to scroll the menu pages by pressing the arrow down button, the following data is displayed:



- Chamber pressure
- Compressor running hours
- Compressor charging hours

The following page is only displayed if the temperature probe of the second compressor is enabled (if there are two compressors), or if the dryer is enabled.



This page can display the following data:

- Oil temperature of the second compressor
- Dew point temperature



One of the next pages displays the following data:

- Date and time of the last compressor start
- Date and time of the last compressor stop

This information helps to understand how long the compressor has been working for or how long it has been stopped for.

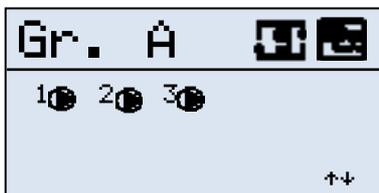
Some other pages are only enabled if the two special operating modes, Optima or Network, are enabled.



In the Optima mode, the page shown to the side, indicating at what speed the compressor is running, is displayed.

As well as the display in numerical format, in this case, the speed variable is also displayed in chart format.

In the Network operating mode, two additional pages referring to the 2 groups of compressors are displayed. These groups work independently but with preset priorities.



The status icons show status of each compressor in the group.

The number indicates the compressor while the icon indicates the status of that compressor.

## 5.2 [ MAIN ] menu

Access this menu by pressing ESC on the first page of the [ Monitor ] menu.



As the menu list comprises several items, just part of it is visualised. The other items can be visualised by using the arrow buttons to scroll the menu. The complete menu list is shown in table 2.

## 5.3 [ USER ] menu

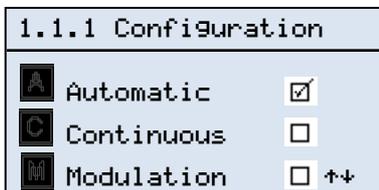
This menu is used to calibrate compressor operation and contains variables that can be modified by the user.



Some variables are grouped by function into submenus.

### 5.3.1 [ Configuration ] submenu

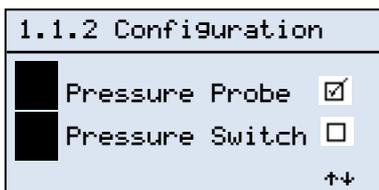
This submenu is used to configure the compressor operating and control modes.



MAESTRO<sup>XS</sup> can operate in different ways:

- Automatic**
- Continuous
- Modulation

This parameter cannot be modified while the compressor is enabled.



MAESTRO<sup>XS</sup> can control the compressor by using a pressure probe or a mechanical pressure switch.

The settings are:

- Pressure probe**
- Pressure switch

This parameter cannot be modified while the compressor is enabled.

This submenu cannot be accessed if the Optima – Network functions are enabled.

If one of these functions is enabled, in fact, the software automatically considers that the machine is working in the automatic mode with pressure control from the probe and therefore denies access to these pages.

### 5.3.2 [Settings] submenu

```

1.2.1 Settings
Maximum Pressure:
          007.7bar
Minimum Pressure:
          006.7bar
Off-load Running Time:
          120sec

```

This submenu is used to configure basic compressor settings, such as:

- Maximum Pressure
- Minimum Pressure
- No-load Run Time

These variables can always be modified.

### 5.3.3 [Service] submenu

This submenu is used to set compressor service times.

```

1.3.1 Service
SET TIMER
Oil       :005000h
Oil Filter :005000h
Sep. Filter :100000h
          ↑↓

```

On the first page of the menu service times can be set for:

- Compressor oil
- Compressor oil filter
- Separator filter

```

1.3.2 Service
Running hours
Oil       :005000h
Oil Filter :005000h
Sep. Filter :100000h
          ↑↓

```

The following page displays the hours already accumulated by the various hour counters.

This information is useful for compressor service engineers.

On this page, each hour counter can be zero-set if the service engineer so requires.

When an hour counter reaches the set number of hours for service, a warning appears on the display. This warning does not stop the compressor, but indicates the need to service the compressor (e.g.: Change oil).

The warning can only be removed by entering a special password (see chapter 9).

### 5.3.4 [Language] submenu

```

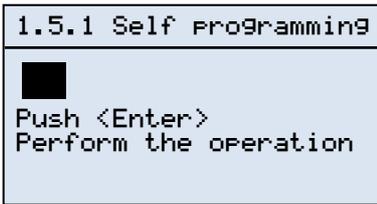
1.4.1 Language
  ■   ■   ■   ■
  ■   ■   ■   ■

```

This submenu is used to configure the language used by the user interface. Only menus that are not password-protected are translated into the selected language. The available languages are:

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

### 5.3.5 [Self - programming] submenu



This submenu is used to return certain parameters to their factory settings.

These are:

- Maximum pressure
- Minimum pressure
- No-load Run Time
- Operating mode
- Control mode

The reset values of maximum and minimum pressure values depend on the rated pressure calibration at the moment auto-programming takes place.

Some default minimum and maximum pressure values are shown below, together with rated pressure values.

Rated pressure	Maximum pressure	Minimum pressure
8 Bar	7.7	6.5
10 Bar	9.7	8.5
13 Bar	12.7	11.5

**Table 6**

The operating and control modes become:

**Operating mode** : Automatic

**Control mode** : Pressure probe

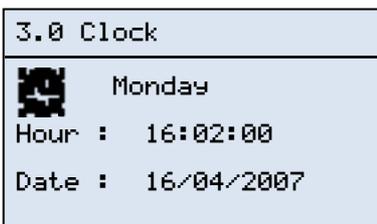
## 5.5 [ CLOCK ] menu

This menu is used to start the compressor or network of compressors totally automatically, in other words, without the need for an operator to physically perform start-up.

There are 2 programming modes:

- 5 days
- 7 days

As explained further on in this manual, the first option involves 3 identical start-ups for every working day (Monday - Friday), while the second involves 3 different start-ups for every day of the week (Monday-Sunday).



When first page of the menu is accessed, the following data is modified:

- Day of the week (extrapolated from the date)
- Hours:minutes:seconds
- Day/month/year



**Attention:** this screen is used to display the time; as it is a data entry template, it is not updated in real-time.

3.1 Weekly Scheduling	
5 days	<input type="checkbox"/>
7 days	<input type="checkbox"/>

The page shown to the side is used to select the compressor operating mode:

- **None** (no selection)
- 5 days
- 7 days

### 5.5.1 [5 Days] submenu

The 5-day mode provides access to page which is used to configure compressor starting and stopping times.

3.1.1 5 days	
On1 00:00	Off1 00:00
On2 00:00	Off2 00:00
On3 00:00	Off3 00:00

The three time bands shown to the side are valid from Monday to Friday. On the other days, the compressor remains off.

3.1.1 5 days	
On1 00:00	Off1 00:00
A+B	
On2 00:00	Off2 00:00
A+B	
On3 00:00	Off3 00:00
A+B	

When the network mode is enabled on the Master compressor, the time configuration page will be similar to the one shown to the side.

The operating typology of the groups can be changed for each time band. This allows flexibility in network configuration where different settings are required during the working day.

The following group management modes can be chosen for each time band:

- A
- B
- A + B
- B + A
- Personal

As can be seen, if operating mode **A** is selected, only group **A** compressors will be started. In the **A + B** mode, first group **A** compressors then group **B** compressors will be started.

In the **Personal** mode, the compressors to start must be directly selected from the various available units. The operating mode will be the one set for group **A**.

## 5.5.2 [7 Days] submenu

The 7-day mode provides access to page which is used to configure compressor starting and stopping times for Mondays.

3.2.1 Monday	
On1 00:00	Off1 00:00
On2 00:00	Off2 00:00
On3 00:00	Off3 00:00

Similarly to the 5-day mode, 3 operating time bands can be set though, unlike the previous mode, these are only valid for the selected day. Programming must be performed on a day-by a day basis.

Also in this case, if the compressor is configured as a Master, the operating modes of the groups will be added.

These different programmes allow the user to configure different start-ups for every day of the week.

3.2.2 Tuesday	
On1 00:00	Off1 00:00
On2 00:00	Off2 00:00
On3 00:00	Off3 00:00

This allows the user to optimise use of the compressor or network of compressors.

## 5.6 [ HISTORICAL ] menu

This menu allows service engineers to check the type of faults that caused the compressor to stop. It also allows them to view any programming changes made by the user or by other service engineers, as well as a chart indicating the most recent compressor start-up.

4.0 Historical	
1	Events
2	Modifications
3	Starts

This menu is also divided into submenus. These submenus are:

- Events
- Modifications
- Start-ups

### 5.6.1 [Events] submenu

In this submenu, the service engineer can discover what fault caused the compressor to malfunction, as it gives indications that are sometimes useful for identifying the problem that generated the fault.

Up to 20 operating faults can be memorised. The first fault takes the number 00 and is always the most recent one. When a second fault occurs, it replaces the previous one which takes the number 01, and so on. When the log is full, fault number 19 is cancelled, the new fault takes the number 00 and all the others move down one position.

Every page indicates a single fault event and displays a set of data helping the service engineer to discover the problem that caused the compressor fault.

4.1 Events	00
cod.00   000000:00:00s	
Aut./Un1   000000:00:00s	
P1 000.0bar Ta 000.0%	
Pc 000.0bar Tr 000.0%	
To1 000.0% To2 000.0%	
Tb1 000.0% Tb2 000.0%	

As shown to the side, every events page displays a set of data concerning the operating hours, temperatures and pressures at the moment of the fault. For further information, consult the [Historical] menu chapter.

## 5.6.2 [Modifications] submenu

The service engineer may use this submenu to check whether modifications have been made to the configuration parameters and whether these modifications may have been the cause of the fault.

4.2 Changes		00
000020:00:00s		
16:20:50	10/06/2006	
Minimum Pressure		
Old	New	
006.5	006.0	

As shown to the side, every modifications page displays a set of data concerning the modified variable, in particular:

- Modification number
- Operating hours at the moment of the modification
- Date and time of the modification
- Description of the modified parameter
- Value of the variable before the modification
- Value of the variable after the modification

4.2 Changes		01
000020:00:00s		
16:04:50	12/06/2006	
Maximum Pressure		
Old	New	
007.5	007.0	

## 5.6.3 [Start-ups] submenu

This submenu is used to check the number of start-ups performed by the compressor during operation.

4.3 Startings	
Total startings :	0000
Today's startings:	0000

In particular, it displays:

- The total number of start-ups performed by the compressor.
- The number of start-ups performed by the compressor in one day.

This menu can be used to monitor the correct setup of the compressor as a low number of motor start-ups means that the unit has been calibrated correctly.

## 5.7 [ NETWORK ] menu

This menu, only accessible if the control function is enabled and only if the compressor is configured as "Master", is used to configure and operate the compressor network as required by the final user.

5.0 Network	
1	Group A
2	Group B
3	Setting
4	Filling Compress.
5	Maintenance

This menu is also divided into various specific submenus which simplify configuration according to user requirements.

5.1.1 Operating Gr A	
Sequence	: <input checked="" type="checkbox"/>
Cascade	: <input type="checkbox"/>
Equalization	: <input type="checkbox"/>
Delivery	: <input type="checkbox"/>
↑↓	

Select "Group A" to configure group A compressors. Possible selections are:

- **Sequence**
- Cascade
- Equalisation
- Flow rate

5.1.2 Rotation Gr A	
None	: <input checked="" type="checkbox"/>
On stop	: <input type="checkbox"/>
Daily	: <input type="checkbox"/>
Weekly	: <input type="checkbox"/>
Monthly	: <input type="checkbox"/>
↑↓	

If the "Sequence" mode is selected, programmed rotation of the first compressor can be selected. This begins when the network is enabled in group A.

5.2.1 Operating Gr B	
Sequence	: <input checked="" type="checkbox"/>
Cascade	: <input type="checkbox"/>
Equalization	: <input type="checkbox"/>
Delivery	: <input type="checkbox"/>
↑↓	

Select "Group B" to configure group B compressors. Possible selections are:

- **Sequence**
- Cascade
- Equalisation
- Flow rate

5.2.2 Rotation Gr B	
None	: <input checked="" type="checkbox"/>
On stop	: <input type="checkbox"/>
Daily	: <input type="checkbox"/>
Weekly	: <input type="checkbox"/>
Monthly	: <input type="checkbox"/>
↑↓	

If the "Sequence" mode is selected, programmed rotation of the first compressor can be selected. This begins when the network is enabled in group B.

5.3 Setting	
Networking mode:	A+B
Filling Line:	060sec
↑↓	

Then decide how to use these configured groups, in other words, select the start-up sequence of the 2 available groups. Possible selections are:

- **A + B**
- B + A
- A
- B

Another parameter to set is the line filling time every time the line is enabled.

5.4 Filling Comp.	
1	<input type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4	<input type="checkbox"/>
↑↓	

One compressor can be selected to fill the line. The display shows the number of compressors available in the network, though just one compressor can be selected to fill the line.

5.5 Maintenance	
1	<input type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4	<input type="checkbox"/>
↑↓	

On the last screen, the "Master" can be informed that a certain compressor has been removed for servicing.

This optimises network performance as the control unit "skips" the absent compressor, thus accelerating dialogue between the local control units.

In the log menu, MAESTRO<sup>xs</sup> memorises compressor data. In particular, any compressor faults and operating parameter modifications are stored.

Access the [Historical] menu to view the following screen.



Fig. 5

The menu is divided into 3 submenus containing the memorised data. These submenus are:

1. Events
2. Modifications
3. Start-ups

## 6.1 Events submenu

During compressor operation, a component may fail or a temperature may exceed the limit deemed suitable for correct operation. These faults must be intercepted and suitably managed by the control unit in order to prevent the compressor from developing much more serious problems or even breaking down.

These faults are defined as “Events”. These can be divided into the following 2 categories, each of which behaves in an extremely different way:

- Event generating an “Alarm”
- Event generating an “Block”

### 6.1.1 Alarm mode

If the event typology is serious enough cause an immediate compressor breakage or serious malfunction, it is defined as an “Alarm”. This is immediately reported to the user but does not stop the compressor.

Even so, this event must be checked out. Contact the technical assistance service if the alarm continues to repeat.

### 6.1.2 Block mode

Unlike the alarm mode, the “Block” mode stops the compressor immediately. In fact, an event of this kind can cause major damage to the compressor and it must therefore be stopped immediately to prevent more serious damage from occurring.

An event of this kind must be carefully assessed by the technical assistance service.

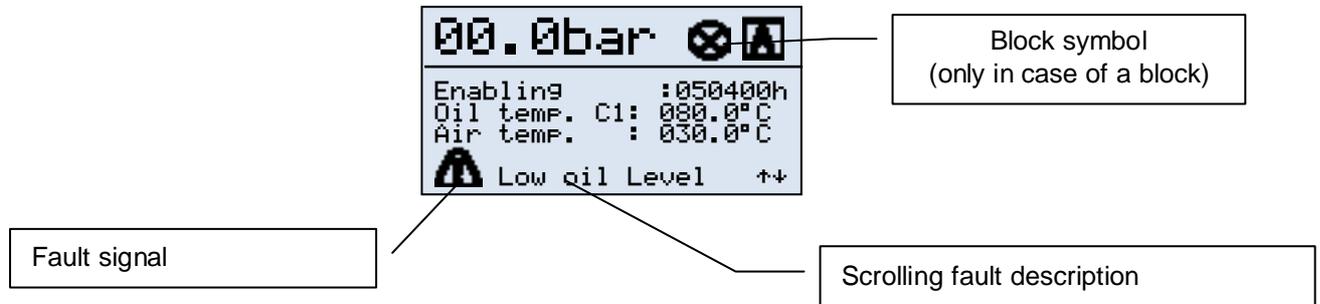


**Attention:** if a failure occurs that stops the compressor due to faulty sensor, do not bypass it by connecting the wires together. If possible, replace the sensor, otherwise consult the Mattei technical assistance service.

### 6.1.3 Event messages

As previously mentioned, if a fault occurs, a message is displayed on the video and the compressor may stop depending on the type of fault involved. In both cases, a message is displayed on the video informing the user that there is a problem with the compressor.

The message is displayed as indicated in the following figure.



A symbol indicating the presence of a compressor fault is displayed in the bottom left-hand corner of the first page of the [Monitor] menu. A scrollable full description of the fault is shown next to it.

The red <Reset> button lights to highlight the fault message. If the event blocks the compressor, the status indicator changes, as shown in the above figure, to indicate that the compressor has stopped due to a serious fault.

Press the <Reset> button to access a screen (see figure 7) describing the fault typology.

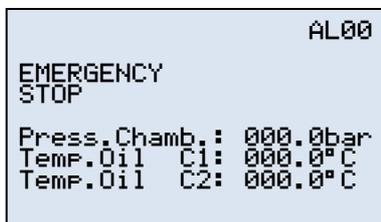


Fig. 6



If more than one fault is recorded before resetting, a list of the faults can be viewed by pressing <↓> and <↑>. The chamber pressure and oil temperature values only refer to the most recent fault.

Press <Reset> again to visualise the screen indicating that no alarm is active (see figure 7). This page means that the fault has been deleted and the compressor is ready to start.



Fig. 7

Press <Esc> to return to the [Monitor] menu and start the compressor. First check out why the compressor stopped, of course, and if, after enabling the compressor, it stops again, do not start it again. Carefully examine the compressor and, if any doubts arise, contact the technical assistance service.



**Attention:** The page shown in figure 7 appears if the <Reset> button is pressed when no faults are present.

### 6.1.4 Saved event messages

The [Events] submenu displays the last memorised event. The page containing an event is shown below and indicates the following information:

4.1 Events	00
cod.00	000000:00:00s
Aut/Un1	000000:00:00s
P1 000.0bar	Ta 000.0%
Pc 000.0bar	Tr 000.0%
To1 000.0%	To2 000.0%
Tb1 000.0%	Tb2 000.0%

- Event number
- Event code
- Operating hours at the moment of start-up
- Operating hours at the moment of fault
- Current operating mode
- Machine status
- Line pressure
- Chamber pressure
- Outlet air temperature
- Dew point temperature if dryer enabled
- Oil temperature of basic compressor (C1)
- Oil temperature of auxiliary compressor (C2)
- Compressor bush temperature (C1)
- Compressor bush temperature (C2)

The above information allows the technical assistance service to identify the type of compressor malfunction. The control unit can memorise up to 24 fault events.

Any additional events overwrite the log, starting from event "00". The most recent memorised event is displayed upon access to the events menu.

A table indicating all the fault codes in the system is shown below. The typology and possible reasons for the fault are also indicated.

Message	Action	Cod	Type	Reason
Emergency Stop	Block	00	Digital	The emergency button on the electric panel has been pressed.
Oil Level Low	Block	01	Digital	Low oil level in chamber (The quantity of oil is lower than that required to ensure correct operation).
Motor Overload	Block	02	Digital	Main motor overload (Temperature in excess of the set limit).
Inverter Malfunction	Block	03	Digital	Malfunction in the connected and managed inverter.
Fan Fault	Block	04	Digital	The compressor door has been opened or the thermal relay protecting the fan motor (if installed) has tripped.
Oil Filter Clogged	Alarm	05	Digital	Oil filter needs replacing due to clogging.
Air Filter Clogged	Alarm	06	Digital	Air filter clogged. This alarm is available if the machine is fitted with the related sensor.
Sep. Filter Clogged	Alarm	07	Analogue	Separator filter clogged.
Oil Temp. Alarm C1	Alarm	08	Analogue	The temperature of the compressor oil has exceeded the alarm temperature.
Oil Temp. High C1	Block	09	Analogue	High temperature of C1 compressor oil (Temperature in excess of the set limit).
Oil Temp. Alarm C2	Alarm	10	Analogue	The temperature of the compressor oil has exceeded the alarm temperature.
Oil Temp. High C2	Block	11	Analogue	High temperature of C2 compressor oil (Temperature in excess of the set limit).
Air Temp. High	Block	12	Analogue	High delivery air temperature (Temperature in excess of the set limit).
C1 Bush Temp. High	Block	13	Analogue	High temperature of C1 compressor bush (Temperature in excess of the set limit).
C2 Bush Temp. High	Block	14	Analogue	High temperature of C2 compressor bush (Temperature in excess of the set limit).
BlackOut	Alarm	15	----	No power input to compressor (only if this option has been enabled).
Start-up Fault	Block	16	Analogue	Fault in the starting sequence and consequent interruption.
Overpressure	Block	17	Digital	Network pressure too high. Detected by external emergency pressure switch.
Change Oil	Alarm	18	Service	Change the oil as the set number of operating hours has been reached.
Oil Filter	Alarm	19	Service	Change the oil filter as the set number of operating hours has been reached.
Separator Filter	Alarm	20	Service	Change the separator filter as the set number of operating hours has been reached.
Ice Alarm	Alarm	21	Analogue	Excessive cooling of dryer (if installed). This message is managed as though it were a block.
	Block	22	Analogue	Excessive cooling of dryer (if installed). This message, however, is managed as though it were an alarm.
Dew Point High	Alarm	23	Analogue	Insufficient cooling of dryer (if installed). This message is managed as though it were a block.
	Block	24	Analogue	Insufficient cooling of dryer (if installed). This message, however, is managed as though it were an alarm.
Input 1 Fault	Alarm	25	Digital	Fault in generic device connected to programmable input 1. Does not stop the compressor.
	Block	26	Digital	Fault in generic device connected to programmable input 1. Stops the compressor.
Input 2 Fault	Alarm	27	Digital	Fault in generic device connected to programmable input 2. Does not stop the compressor.
	Block	28	Digital	Fault in generic device connected to programmable input 2. Stops the compressor.
Input 3 Fault	Alarm	29	Digital	Fault in generic device connected to programmable input 3. Does not stop the compressor.
	Block	30	Digital	Fault in generic device connected to programmable input 3. Stops the compressor.

Table 7

Message	Action	Cod	Type	Reason
Chamber Probe Failure	Block	31	Software	Fault in the pressure probe mounted on the compressor chamber. Also indicates an interruption in the connection.
Line Probe Failure	Block	32	Software	Fault in the pressure probe mounted on the radiator. Also indicates an interruption in the connection.
Air Probe Failure	Block	33	Software	Fault in the temperature probe mounted on the radiator. Also indicates an interruption in the connection.
C1 Oil Probe Failure	Block	34	Software	Fault in the temperature probe mounted on the compressor. Also indicates an interruption in the connection.
C2 Oil Probe Failure	Block	35	Software	Fault in the temperature probe mounted on the compressor. Also indicates an interruption in the connection.
C1 Bush Probe Failure	Alarm	36	Software	Fault in the temperature probe mounted on the compressor bush. Also indicates an interruption in the connection.
C2 Bush Probe Failure	Alarm	37	Software	Fault in the temperature probe mounted on the compressor bush. Also indicates an interruption in the connection.
Dew Point Probe Failure	Alarm	38	Software	Fault in the temperature probe mounted on the dryer. Also indicates an interruption in the connection.
Clock Error	Alarm	39	Software	Clock module incorrectly connected.
Expansion 1 Error	Block	40	Software	Communication failure between the basic board and expansion board 1
Expansion 2 Error	Alarm	41	Software	Communication failure between the basic board and expansion board 2
Time Out Slave	Block	42	Software	Indicates that in the "network" operating mode the slave compressor is unable to communicate with the "Master" control unit.
C1 Bush Temp. Alarm	Alarm	43	Analogue	The temperature of the C1 compressor bush has exceeded the alarm temperature.
C2 Bush Temp. Alarm	Alarm	44	Analogue	The temperature of the C2 compressor bush has exceeded the alarm temperature.
	Block	45	Software	Communication failure between the basic module and the video terminal.

Table 8

## 6.2 Video connection management

All compressor commands are normally given from the MAESTRO<sup>XS</sup> keyboard. If the latter breaks, it would prevent the user from starting or stopping the compressor.

Mattei has found a way round this problem. If for any reason communication between the basic terminal and the video terminal fails for more than 30 seconds, the compressor stops immediately.

As indicated in table 18, the related code is 45, but the message will only be available in the events log and not on the video.

## 6.3 Modifications submenu

This submenu contains the modifications made to the analogue parameters configured by the control unit. If the compressor develops a fault, this function can be used to understand if the fault is due to the incorrect setting of one or more parameters.

Similarly to events, up to 20 modifications can be memorised after which the oldest modification is deleted and the most recent one is given the number "00".

Each page of this submenu shows the following information:

4.2 Changes	00
16:20	000020:00min 10/06/07
Minimum Pressure	
Old	New
006.5bar	006.0bar

- Modification number
- Operating hours at the moment of the modification
- Date and time of the modification
- Description of the modified parameter
- Value of the variable prior to the modification
- Value of the variable after the modification

The variables memorised by the control unit are shown in the following table. This allows any modifications to be traced.

<b>Settings submenu</b>	<b>Dryer submenu</b>
Pmax	Ambient delta
Pmin	Oil delta
<b>Threshold submenu</b>	<b>Debug submenu</b>
Start-up pressure	Line probe full scale
Separator clogged	Line probe offset
High air temperature	Chamber probe full scale
Oil pre-alarm	Chamber probe offset
Oil alarm	<b>Inverter submenu</b>
Fan control	Differential pressure Pmax
Fan differential	
Bush pre-alarm	
Bush alarm	

Table 9

## 6.4 Start-ups submenu

This submenu is used to monitor the start-ups performed by the compressor during its operating lifetime. In particular, the following can be monitored:

4.3.1 Startings	
Total startings	: 0000
Today's startings	: 0000

- The total number of start-ups performed by the compressor.
- The total number of start-ups performed during the day by the compressor.

The first hour counter counts all the start-ups performed during the lifetime of the control unit.

The second hour counter counts the start-ups performed during the day. This counter is zero set every time the on-board clock passes midnight.

These counters are used to check the compressor settings. If the machine is correctly configured, the number of daily start-ups will be low.



**Attention:** If a control unit is replaced, all this information is lost as it is not possible to transfer it to the new control unit.

# PASSWORD MANAGEMENT

MAESTRO<sup>XS</sup> is protected from tampering by authorised staff by means of passwords protecting access to the various menus and special functions. These can be divided into the following two categories:

- USER password
- SERVICE password

## 7.1 USER password

This simply allows a service event to be cancelled. When the time set in the [User \ Service] menu elapses, a message is displayed on the video and the <Reset> button lights up.

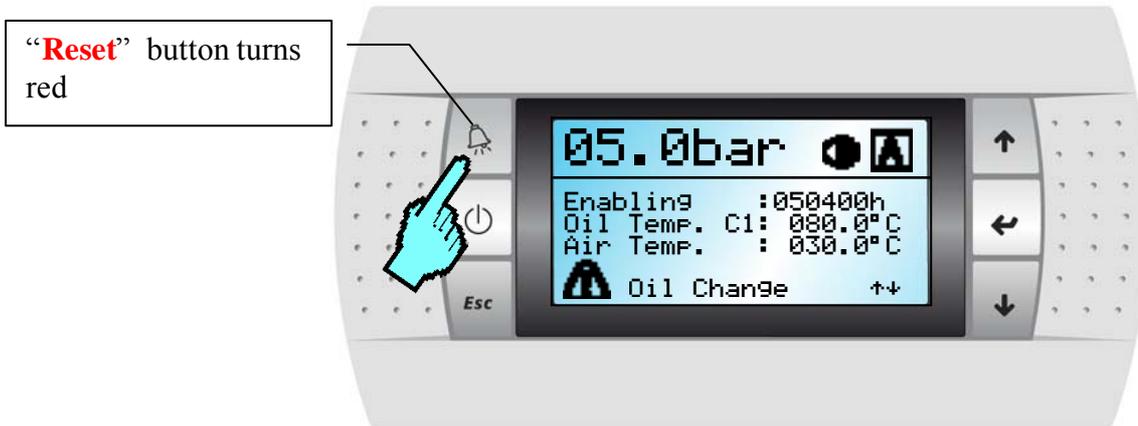


Fig. 8

To delete the messages generated by the hour counters, a password must be entered. This prevents unauthorised people from accidentally deleting messages.

The password is comprised of a combination of certain keys which, pressed in sequence, form a kind of combination.

When requested, it must be entered in the template shown below



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



The service password is not given to the final user as the service menus are reserved to Mattei.

## WEEKLY PROGRAMMING

Chapter  
8

MAESTRO<sup>XS</sup> can be used to automatically start the compressor using the on-board clock.

To use this function, access the [Clock] menu and select one of the following 2 modes:

- ✓ 5 day mode
- ✓ 7 day mode

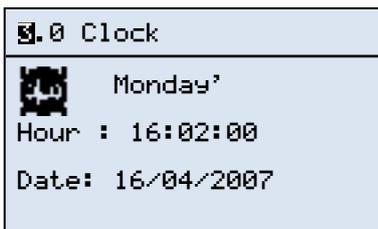
3 daily time bands are available for both operating modes. Each time band has a different operating priority:

- Band 1 High priority
- Band 2 Medium priority
- Band 3 Low priority

In other words, band 1 has priority over band 2, and so on. The validity of the times inserted in the each band, such as a stop time prior to a start time, is checked.

As there is no control between the 3 time bands, take great care when entering times.

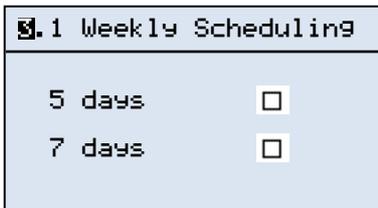
## 8.1 Enabling programming



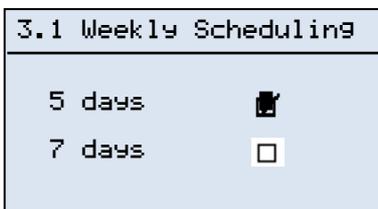
To enable weekly programming, access the [Clock] menu where the cursor flashes on the first digit in the top left-hand corner of the screen. Press <↓> to access the enable page and select the required programme.



**Attention:** Maestro does not manage the transition from winter to summer time and vice-versa. This must be done manually.



After entering the enable page, press <↵> to choose the required operating mode.



Press <↓> or <↑> to enable the selected function. A tick appears on the display indicating that the requested function has been selected (e.g.: 5-day mode).

Press <↵> until the cursor returns to the top left-hand corner of the video.

## 8.2 5-day programming

In the 5-day mode, the compressor can only be used on standard working days, Monday to Friday, with identical time bands for each of those days.

### **Example:**

Start at 08:00 >>>>> Stop at 17:00

3.1.1	5 days	
On1	08:00	Off1 17:00
On2	00:00	Off2 00:00
On3	00:00	Off3 00:00

This configuration allows the compressor to operate in a defined time band, valid from Monday to Friday. As previously mentioned, there are 3 time bands which allow optimised flexibility of use of the compressor. Compressor operation can be stopped during the day at the times when it is not required. A typical configuration involves stopping the compressor during the lunch break.

### **Example 1:**

Band 1 Start at 08:00 >>>>> Stop at 12:00

Band 2 Start at 14:00 >>>>> Stop at 18:00

Band 3 Start at 00:00 >>>>> Stop at 00:00

3.1.1	5 days	
On1	08:00	Off1 12:00
On2	14:00	Off2 18:00
On3	00:00	Off3 00:00

The third time band is inactive as setting "00:00" in both the On and the Off fields automatically disables it.

### **Example 2:**

Band 1 Start at 00:00 >>>>> Stop at 24:00

3.1.1	5 days	
On1	00:00	Off1 24:00
On2	00:00	Off2 00:00
On3	00:00	Off3 00:00

This type of programming allows the compressor to be used non-stop throughout the 5 day period.

### 8.3 7-day programming

In the 7 day mode, different operating time bands can be configured for every day of the week. Unlike the mode described above, this optimises compressor flexibility. By exploiting the 3 time bands available for each day, different time bands can be configured for each day of the week, as shown in the following example.

**Example:**

❖ Monday

Band 1 Start at 08:00 >>>>> Stop at 17:00  
 Band 2 Start at 00:00 >>>>> Stop at 00:00  
 Band 3 Start at 00:00 >>>>> Stop at 00:00

3.2.1 Monday	
On1 08:00	Off1 17:00
On2 00:00	Off2 00:00
On3 00:00	Off3 00:00

❖ Tuesday

Band 1 Start at 08:00 >>>>> Stop at 12:00  
 Band 2 Start at 14:00 >>>>> Stop at 18:00  
 Band 3 Start at 00:00 >>>>> Stop at 00:00

3.2.2 Tuesday	
On1 08:00	Off1 12:00
On2 14:00	Off2 18:00
On3 00:00	Off3 00:00

❖ Wednesday

Band 1 Start at 08:00 >>>>> Stop at 12:00  
 Band 2 Start at 13:00 >>>>> Stop at 16:30  
 Band 3 Start at 18:00 >>>>> Stop at 22:00

3.2.3 Wednesday	
On1 08:00	Off1 12:00
On2 14:00	Off2 18:00
On3 00:00	Off3 00:00

Etc.

### 8.4 Disabling weekly programming

Weekly programming can be temporarily disabled when the compressor is due to be shut down. This is very useful when the compressor needs to be used, for example, on Saturdays to perform system maintenance when the compressor operates in the 5 day mode.



When weekly programming is enabled, a clock symbol is displayed on the monitor. To disable programming, proceed in one of the following ways. The first is to enter the clock menu and disable the selected mode. The second involves pressing < ↵ > for five seconds. The clock icon starts flashing to inform the user that programming has been disabled.

To start the compressor, press the <On/Off> button, similarly to standard manual starting. To stop the compressor, press the <On/Off> button and wait for it to stop. After it has stopped, press < ↵ > for five seconds to restore weekly programming.

## 8.5 Special programming

In the 7 day operating mode, time bands allowing constant operation for two or more days can be configured if continuous operation during the week is required.

**Example:**

❖ Monday

Band 1 Start at 08:00 >>>>> Stop at 24:00  
 Band 2 Start at 00:00 >>>>> Stop at 00:00  
 Band 3 Start at 00:00 >>>>> Stop at 00:00

3.2.1 Monday	
On1 08:00	Off1 24:00
On2 00:00	Off2 00:00
On3 00:00	Off3 00:00

❖ Tuesday

Band 1 Start at 00:00 >>>>> Stop at 12:00  
 Band 2 Start at 14:00 >>>>> Stop at 18:00  
 Band 3 Start at 00:00 >>>>> Stop at 00:00

3.2.2 Tuesday	
On1 00:00	Off1 12:00
On2 14:00	Off2 18:00
On3 00:00	Off3 00:00

The above example simulated the need to use the compressor all day Monday and the morning of Tuesday without stopping. To do this, simply set the times as shown in the example.

## 8.6 Programming a network

There may be a network of compressors which must be started at preset times. To start the network, only the “Master” compressor requires configuring as all the compressors in the network are controlled by the “Master” compressor.

Enter the programming template (e.g.: 5 days). In addition to the time band settings, there are also other indications concerning how the two groups of compressors that have been created (see Network chapter) are to be used. In other words, the number of compressors in use can be reduced if consumption is limited in a certain time band and is therefore covered by just one group of compressors.

Suppose there is a network comprising 4 compressors and these compressors have been divided as follows:

Group A = C1 + C2  
 Group B = C3 + C4

3.1.1 5 days	
On1 08:00	Off1 12:00
A+B	
On2 14:00	Off2 18:00
A	
On3 00:00	Off3 00:00
A+B	

In this way, a lot of air is used in the morning while consumption is greatly reduced in the afternoon. As there is no point in enabling the entire network if the production of group A compressors is sufficient, group B can be disabled in the afternoon, thus saving power in terms of electricity consumption.

It is possible to create a mixed group of group A and group B compressors. This makes a network utilisation even more flexible.

3.1.1	5 days
On1 08:00	Off1 12:00
	Personal
On2 14:00	Off2 18:00
	A
On3 00:00	Off3 00:00
	A+B

Fig. 9

By entering "Personal" in one of the 3 available time bands (see fig. 10), after reaching the end of time band programming, that is, when the cursor returns to the top left-hand corner of the screen, press <↓> to display one or more of the pages (see fig. 11) used to select the compressors required for that time band.

3.1.1.1	5 days
1 <input checked="" type="checkbox"/>	2 <input type="checkbox"/>
3 <input type="checkbox"/>	4 <input checked="" type="checkbox"/>

Fig. 10

Figure 11 simulates use of compressors 1 and 4 which, with reference to the previous example, belong to different groups. These configuration possibilities allow the network to be adapted to various customer requirements.

## 8.7 Checking entered times

MAESTRO<sup>xs</sup> features a control of compressor starting and stopping time entries. When a starting time is entered, in fact, it is automatically indicated as the stopping time. This prevents stopping times before the starting times from being entered.

Suppose we wish to enter the following programme:

3.1.1	5 days
On1 08:00	Off1 00:00
On2 00:00	Off2 00:00
On3 00:00	Off3 00:00

Band 1 Start at 08:00 >>>>> Stop at 17:30

Press <↓> to move the cursor to the On1 hours related to time band 1.

3.1.1	5 days
On1 08:00	Off1 00:00
On2 00:00	Off2 00:00
On3 00:00	Off3 00:00

Press <↑> <↓> to modify the "Start" hours and then <↓> to select "Start" minutes.

3.1.1	5 days
On1 08:00	Off1 08:00
On2 00:00	Off2 00:00
On3 00:00	Off3 00:00

When the "start" hours value is confirmed, the "Stop" hours value is automatically updated with the "start" hours value. The same applies to minutes.

3.1.1	5 days
On1 08:00	Off1 17:00
On2 00:00	Off2 00:00
On3 00:00	Off3 00:00

Now increase the hours and minutes values to reach the required stop time.

3.1.1	5 days
On1 08:00	Off1 17:30
On2 00:00	Off2 00:00
On3 00:00	Off3 00:00

Press <↵> until the cursor returns to its original position and then press <Esc> until the [Monitor] menu appears.



**Attention:** The presence of the above control function does not mean the operator does not have to pay attention when entering the times.

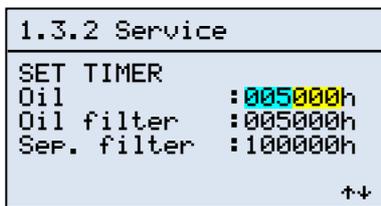
# HOUR COUNTERS

MAESTRO<sup>XS</sup> is fitted with a number of hour counters which, as well as calculating operating hours, also manage maintenance frequencies of compressor parts subject to wear.

For this purpose, the following two types of hour counters are available:

- Operating hour counters
- Maintenance hour counters

The first inform the user about operating hours of the compressor, while the second warn users that a pre-established operating period has expired and that maintenance work is required.



Before going on to describe the hour counters, it should be pointed out that each MAESTRO<sup>XS</sup> hour counter is divided into 2 parts, as shown in the figure to the side. This accelerates the timer configuration process.

**Fig. 11**

The first part of the hour counter shows the following items, from right to left:

- Thousands of hours.
- Tens of thousands of hours.
- Hundreds of thousands of hours.

The second part of the hour counter shows the following items, from right to left:

- Units of hours.
- Tens of Hours.
- Hundreds of hours.

Instructions for using the various maintenance hour counters are shown below.

## 9.1 Operating hour counters

MAESTRO<sup>XS</sup> provides users with 3 types of hour counter , each with different operating modes. Unlike maintenance hour counters, they cannot be modified by the user. The operating hour counters displayed are:

- Enable hour counter
- Run hour counter
- Charge hour counter

### 9.1.1 Enable hour counter

The “enable” hour counter shows the number of hours the compressor has been enabled or made available for operation. This hour counter also considers the periods in which the compressor is not on because it has stopped during the operating cycle.  
Compressor enable is signalled by the yellow LED on the “On” button lighting up.

### 9.1.2 Run hour counter

The “Run” hour counter indicates how many hours the compressor has been running. The machine maintenance hour counters are linked to this hour counter.

### 9.1.3 Load hour counter

The “Load” hour counter shows the number of hours the compressor has been running loaded.

## 9.2 Scheduled maintenance frequencies

The maintenance hour counters warn users that the compressor parts subject to wear must be serviced in order to ensure correct operation.

```

1.0 User
-----
1.1 Configuration
1.2 Settings
1.3 Service
1.4 Languages
1.5 Self programming.
    
```

Enter the [User] menu and use the cursor to select the [Service] submenu to access the maintenance frequencies setting page.

```

1.3.1 Service
-----
SET TIMER
Oil           :005000h
Oil Filter    :005000h
Sep. Filter   :100000h
                ↑↓
    
```

The first screen is the one in which the maintenance frequencies of the main components that must be replaced can be decided. These are:

- Compressor oil
- Oil filter
- Air/oil separator filter

```

1.3.2 Service
-----
Running hours
Oil           :005000h
Oil Filter    :005000h
Sep. Filter   :100000h
                ↑↓
    
```

The second screen, instead, displays the hours accumulated by the various hour counters in order to programme compressor maintenance times.

When one of the timers reaches the number of hours set for scheduled maintenance, a signal appears on the display warning that the unit requires servicing (e.g. changing the oil). As will be seen further on, this signal can only be removed by entering a password which, if correct, also zero sets the related hour counter.

### 9.2.1 Modifying Timers

Enter the [1.3.1 Service] menu to set the required maintenance frequency, through always referring to Mattei recommendations.

After accessing the page, the cursor flashes in the top left-hand corner. Press < ↓ > to move it to the first field of the “Oil” timer. Press it again to move to the second part of the timer, and once again to move it to the first field of the second timer “Oil filter”, and so on.

To change the value of a timer, after moving the cursor to the part of the timer to modify, press < ↓ > or < ↑ > to decrease or increase the previous value.

For example, to change the value of the “Oil filter” timer from 5,000 hours to 4,500 hours, first access the [1.3.1 Service] menu.

```

1.3.2 Service
-----
SET TIMER
Oil           :005000h
Oil Filter    :005000h
Sep. Filter   :100000h
-----
                                     ↑↓
    
```

Then press < ↓ > 3 times until the cursor flashes on the first part of the timer (see figure to side), press < ↓ > until the 4 in the thousands field is visualised.

```

1.3.2 Service
-----
SET TIMER
Oil           :005000h
Oil Filter    :004000h
Sep. Filter   :100000h
-----
                                     ↑↓
    
```

After entering the required value, press < ↓ > to move the cursor to the second part of the timer. Then press < ↑ > until 500 is displayed.

```

1.3.2 Service
-----
Running hours
Oil           :005000h
Oil Filter    :004500h
Sep. Filter   :100000h
-----
                                     ↑↓
    
```

Press < ↓ > until the cursor returns to its original position.

```

1.3.2 Service
-----
Running hours
Oil           :005000h
Oil Filter    :004500h
Sep. Filter   :100000h
-----
                                     ↑↓
    
```

Press < Esc > to exit the menu or < ↓ > to access the [1.3.2 Service] menu displaying the hours accumulated by the hour counters.

### 9.3 Maintenance Signal



Fig. 12

When one of the hour counters reaches the set number of hours, it gives the user a visual signal that servicing is required (e.g.: oil). The screen displays an icon alongside a description of the type of fault. The reset button also turns red to highlight the fact that a fault condition has occurred. The compressor, however, does not stop as just the need to carry out this activity is signalled.

A password is required to eliminate the maintenance signal (see password management) in order to prevent accidental deletion.

Press <Reset> to display the page identifying the type of event. The user is then informed that, as indicated in the example, the compressor oil must be changed.



Fig. 13

Press <Reset> once again to display a page requesting the password required to eliminate the fault and automatically reset the OIL hour counter.

Only by entering this password will it be possible to eliminate the signal. If not, it will be continuously repeated until the password is entered.

# REMOTE CONTROLS

Chapter  
10

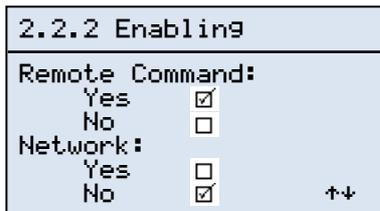
MAESTRO<sup>xs</sup> can remotely control some compressor management and status functions, such as enabling and disabling, fault signalling, etc..

## 10.1 Remote enable

The compressor is usually enabled or disabled with the “On/Off” button of the keypad. However, it is also possible to enable the compressor with a digital contact in another room.

To do so:

1. make a contact that:
  - If **Open** disables the compressor.
  - If **Closed** enables the compressor.
2. enable the function from the [**Advanced / Enables**] menu.



To enable the remote enable / disable command, select “Yes” for the [Remote control] function in the **2.2.2 Enables** menu. Then perform primary enabling by pressing <On/Off> on the keypad.

Fig. 14

Now, the compressor can be remotely enabled / disabled. This instruction is given with a 24 Vdc command provided by the unit. Therefore, the maximum distance for this command must not exceed 200 metres. If it does, install signal repeaters (performed by customer).



**Attention:** a request must be made to the Technical Assistance Service to enable this function

Figure 15 shows a simple method of connecting the remote enable command in which a switch is used to achieve the function.

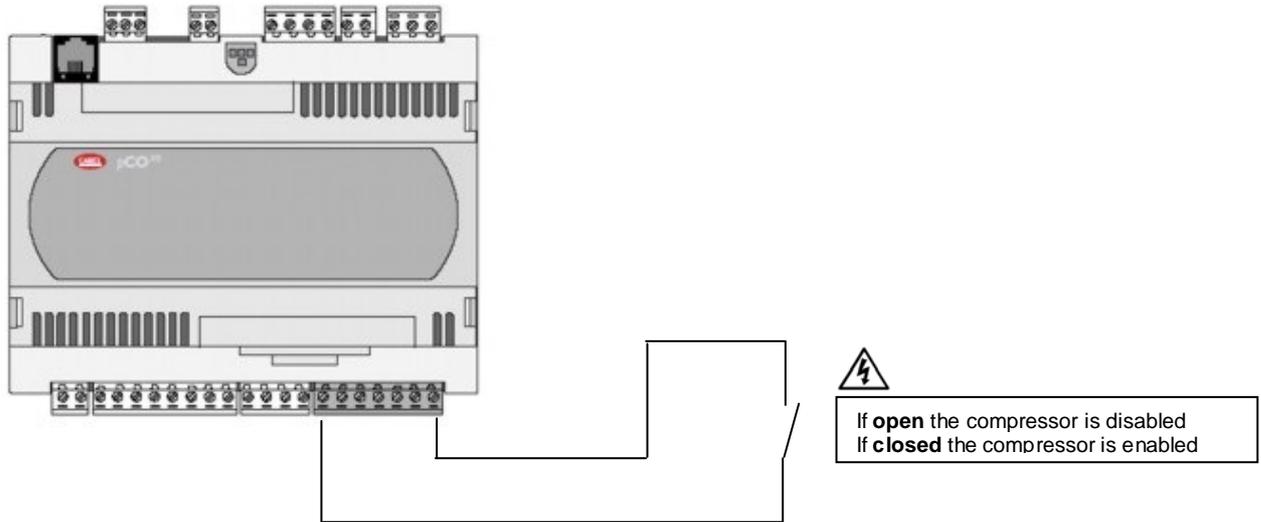
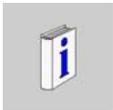


Fig. 15

This command can be performed without the need for expansion boards. In fact, the command is a standard part of the electrical equipment where the control unit is installed.

To remotely enable the compressor, first enable it from the on-board keypad. Only if this operation is performed will the remote control work. If this is not done, closing the remote contact will have no effect on the compressor.



Enabling the compressor does not mean starting the compressor. In fact, starting depends on the line pressure detected by the on-board probe. If line pressure lies between "Minimum pressure" and "Maximum pressure" the compressor does NOT start but reverts to STAND-BY.

## 10.2 Remote signalling

At times it may be necessary to transmit compressor operating data to a remote location. The following machine status signals can be viewed from a remote location:

- Compressor blocked
- Compressor enabled
- Compressor running
- Compressor loaded

These signals are obtained by using voltage-free contacts.

In order to ensure correct system operation, the following parameters must be observed:

- Maximum applicable voltage **240 Vac 48 Vdc**
- maximum applicable load **6 A** resistive

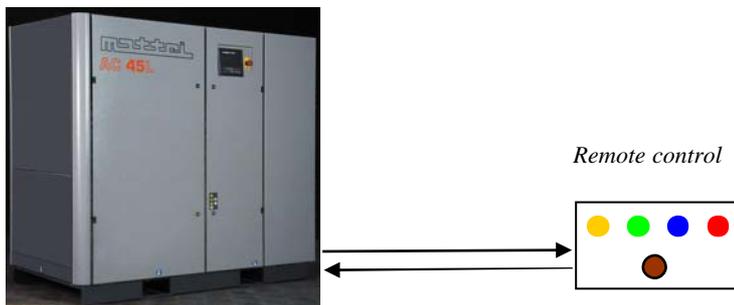


Fig. 16

The first signals available for all compressor models is supplied by default from the basic module via a switched output.

The other signals can only be obtained by installing the expansion module (code **AC40C23976**).

On some models, these signals are already present by default as the expansion board is already installed by Mattei. This information can be directly obtained from the electric screen supplied with the compressor.

These signals are provided by closing **N.O.** contacts.

# TROUBLESHOOTING

## Chapter

# 11

This chapter gives a description of faults that may occur to MAESTRO<sup>XS</sup>. They are divided into:

- General faults
- Dryer-related faults
- Inverter-related faults
- Network faults

For every category, the problems that may arise are listed together with the possible reasons and any remedies for eliminating the fault on site without having to replace the electronics as the problem may have other causes.

generally speaking, always check that the compressor is powered correctly and that the mains voltage lies within the rated values of the compressor as otherwise, malfunctions may occur that would not if the voltage were correct.



**Attention:** Do not work on the electrical panel with the power supply on unless expressly authorised to do so.

If possible, carry out checks with the machine disconnected from the power supply in order to avoid electrocution.

## 11.1 Generic problems

These can occur on all versions.

Problem	Reason	Remedy
<b>MAESTRO<sup>xs</sup> does not turn on</b>	No power	Check the mains power supply, check the 24 Vac output from the transformer.
	Electrical connection out of phase	Check the phase sequence relay and the network connection.
	Fuses blown	Replace fuses
	Faulty connection on terminal board	Check the terminal board connections.
	Door open safety relay faulty	Replace relay
	Video terminal faulty	Check that the standard module is correctly powered and that the phone cable is correctly connected.
<b>MAESTRO<sup>xs</sup> switches on but the display remains blank</b>	No programme	Run the programme (only Mattei staff)
	Video terminal faulty	Replace video terminal
	Video terminal addressing incorrect	Correct the address (Only Mattei staff).
	Phone cable incorrectly connected	Check the connection
	Memorised addresses incorrect	Check the logic addresses of the control unit and terminal.
<b>When “On” is pressed, the compressor does not start</b>	Chamber pressure exceeds the start threshold value	Wait for pressure to drop.
	Line pressure is greater than Pmin	
	The compressor is connected in the network mode	Starting depends on the chosen order of operation. Wait for the compressor to be called.
	A block is active.	Check and correct the fault.
	Remote control enabled.	Check the status of the remote control.
	An active time band is out of the operating range.	Check weekly programming.
<b>“NO LINK” appears on the display</b>	No communication between board and terminal.	Check the board and video addresses.
<b>Pressure values incorrect</b>	Pressure probes faulty	Replace pressure probe
	Operating field of probes different from that set on the control unit	Set the correct operating field in the “Debug” menu (only Mattei staff).
	0 pressure is given a value (e.g. 0.1 bar)	Change the probe offset in the “Debug” menu (only Mattei staff).
	Probes incorrectly connected	Check probe connections.
<b>Incorrect temperature values</b>	Faulty probes	Replace probes
	Probes incorrect	Check they are NTC probes
	Incorrect or interrupted connections	Check probe connections
	Imprecise values	Change the probe offset in the “Debug” menu (only Mattei staff).

## 11.2 Dryer malfunctions

These malfunctions are closely linked to the installation and user of compressors fitted with dryers.

Problem	Reason	Remedy
<b>The dew point temperature does not fall in operating values</b>	Dryer fuses blown.	Replace the dryer fuses.
	The dryer compressor does not work.	Check the dryer input voltage. Call the Mattei assistance service.
	The dryer fans do not work	
	The cooling system is insufficient for the flow rate delivered.	Call the Mattei assistance service.
	One of the dryer protections has tripped.	Check the protections and consult the dryer manual.
	The electrical protection of the dryer compressor has tripped.	Wait for it to automatically reset.
<b>The dew point temperature falls below 0°C</b>	The dryer compressor is not stopped.	Check the MAESTRO <sup>XS</sup> commands. The control contactor is blocked closed.
	The mechanical step valve is blocked.	Call the Mattei assistance service.

## 11.3 Inverter malfunctions

These malfunctions are closely linked to the installation and user of compressors fitted with frequency variators (inverters).

Problem	Reason	Remedy
<b>The compressor does not start and signals “Starting problem”</b>	Inverter reference voltage not delivered.	Check the control voltage on the inverter.
	Faulty or incorrect connection between junction box and inverter.	Check the electrical connections.
<b>Compressor speed not affected by changes in pressure</b>	The MAESTRO <sup>XS</sup> is faulty.	Replace the MAESTRO <sup>XS</sup>
	Cable for reference 0 ÷10 Vdc disconnected or interrupted.	Check the connection between the board and the inverter.
	Incorrect Pmin and Pmax calibration	Check calibration.
<b>Cannot delete “Inverter fault” message</b>	Some inverter-related faults can only be reset by disconnecting the power supply.	Disconnect the dryer power supply for at least 30 seconds and then power the compressor again.

