
# MANUALE ISTRUZIONI
# OPERATOR'S HANDBOOK
# MANUEL D'UTILISATION
# GEBRAUCHSANWEISUNG
# MANUAL DE ISTRUCCIONES

# MICRO SMART

SUSTAINABLE PROGRESS

CATTANI
AIR TECHNOLOGY

ENGLISH

CATTANI
AIR TECHNOLOGY

# MICRO SMART

## SUSTAINABLE PROGRESS

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# • *General running data of the Micro-Smart dental aspirator*

| Model | Micro-Smart |
|---|---|
| Rated voltage | 230 V ~ |
| Rated frequency | 50/60 Hz |
| Rated current | 6,3 A |
| Protection against electric shock | Class *I* |
| Operating conditions | Continuous operation |
| Protection against ingress of liquids | Ordinary |
| Degree of protection against electric shock | Type B |
| Max. absorbed power | 1,30 kW |
| Max. flow | 55 $m^3/h$ |
| Max. head for continuous service | 2100 mm $H_2O$ |
| Sound pressure (version without box) from 60Hz to 120Hz | from 64 dB(A) to 71 dB(A) |
| Aspirating unit sound pressure (version with plastic box) from 60Hz to 120Hz | from 63 dB(A) to 68,5 dB(A) |
| Sound pressure (version with indoor box) from 60Hz to 120Hz | from 41 dB(A) to 48 dB(A) |
| Sound pressure (version with outdoor box) from 60Hz to 120Hz | from 54,5 dB(A) to 61,2 dB(A) |

| | | |
|---|---|---|
| ~ | Alternating current | IEC 417-5032 |
| ⏚ | Earthing | IEC 417-5019 |
| | Degree of protection against electric shock | CEI EN 60601-1 |
| ○ | Open (disconnected from the main electrical supply) | IEC 417-5008 |
| I | Closed (connected to the main electrical supply) | IEC 417-5007 |

Sound pressure level tested according to the standard ISO 3746-1979 (E).
Parameters: r = 1,5 – background noise: 34 dB (A) – instrument Bruel & Kjær type 2232.

# • Introduction
# • Signals and warnings



## • Introduction

This booklet is intended to illustrate the installation and initial operation of the appliance. It also informs on possible dangers and the precautions that should be taken in order to avoid accidents.

This manual should be always available for consultation during installation, initial operation, use and maintenance operations of Micro-Smart.

Our updated manuals are available at **www.cattani.it**.

We recommend their consultation, especially for **updates** concerning **safety**.

## • Signals and warnings

*•Electrical shock risk: also 230 V ~ can be lethal.* 

*• Biological danger, risk of infections from epidemic diseases.* 

*• General danger sign.* 

*• Personal protections for heavy works.* 

*• Personal protections against biological danger.* 

*• High temperature.* 


*• Keep the room free from flammable, corrosive or explosive material.* 

*• Compulsory direction of flow or of rotation.* 

**Warning signs cannot always fully express danger warnings, therefore it is necessary that the user reads the warnings and keeps them in due consideration.**

**Failure to observe a danger sign or warning may harm operators or patients.**

**Safety devices must not be removed. Appliances or their functioning must never be modified.**

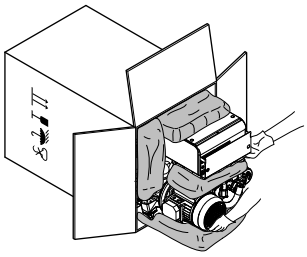
Despite all of our best efforts, it is still possible that danger warnings are not complete: we apologise to the users and kindly request that you pay strict attention to all possible sources of danger that may have passed unnoticed, and to inform us of any that have done so.

# • Installation and initial operation

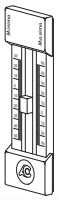
## • Recommended precautions

Before unpacking the appliance, check the warning shock-watch on the carton. In the case of it being red or the carton being damaged, accept the material while reserving the right to examine the machine.


Unpack the appliance following the instructions shown on the package. The carton is recyclable. Dispose of it in compliance with regulations in force. Retain the plastic caps that cover all inlets and outlets of the unit, as they must be used if the machine needs to be moved or transported.

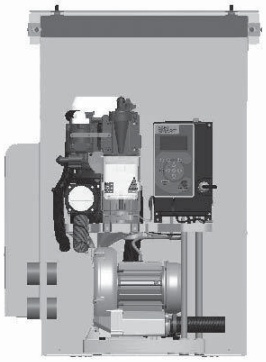


The machine installation must be carried out by a specialist, equipped with the necessary tools. Install the appliance in a clean location, far from heat sources, humidity and dust. Micro-Smart can be installed outdoors (on a balcony, in veranda or gardens), provided that it is sheltered from rain, humidity, frost and direct sunshine.



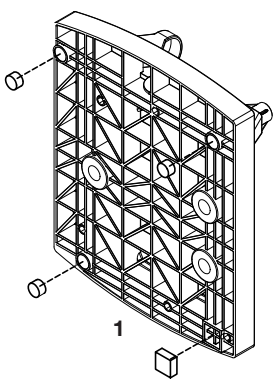
For outdoor installation we recommend the use of our special designed box fitted with double isolating roof, anti-freeze and ventilation systems (both fitted with fixed thermostat for automatic temperature control).

In the plant room temperature can range from a minimum of + 5 °C to +35 °C max.



Micro-Smart fitted with box, for indoors or outdoors installation, can be supplied with antifreeze device. In the case of the plant room requiring ventilation or air-conditioning, we suggest that you contact a thermo-technician for a tailored solution. The plant room must be closed to patients and extraneous people. If such a room is not available, machines must be protected by a suitable cover, which must not be easy to remove. Use protections and danger warning boards to prevent accidental risk from electrical shocks, and/or the possibility (unlikely but not excludible) of fire, explosion and contaminating air or liquid leakage. Only use boxes and covers, be them for indoors or outdoors, that are designed and produced by the manufacturer.


Keep the plant room free from flammable material. Make sure that there is no possibility for gas leakages. Do not connect damaged appliances to the mains power supply. Do not use extension leads, multiple plugs or sockets. Before connecting the machine to the mains, ascertain that the feeding line is complying with the regulations C.E.I. 64-8 and that a thermal switch and a residual current operated circuit-breaker (class A or B) (16A) according to the regulations EN 61008-1 are installed. Light coloured, wooden, linoleum, rubber or marble floors can change colour or be marked if they are kept in contact with rubber vibration-proof devices **(1)**. Therefore, it is necessary to use a rubber sheet or some other suitable material to isolate vibration-proof devices from the floor.



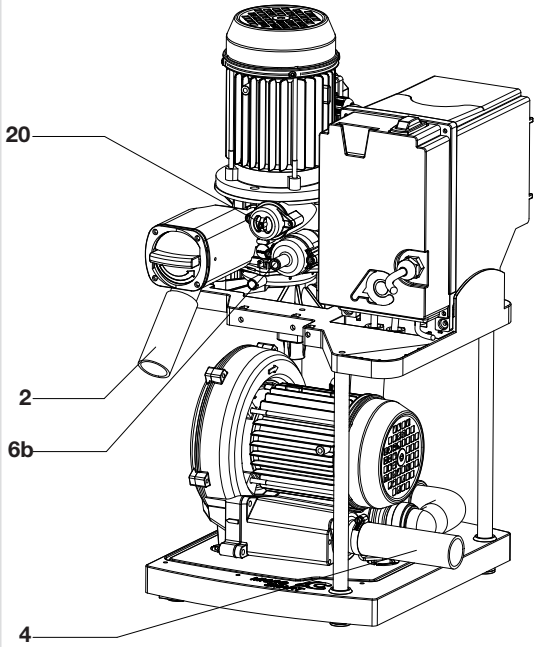
## • *Installation*

Before connecting the aspirator to the piping of the centralized system, ascertain that aspiration piping is clean, as heavy debris can damage the appliance.

Connect the PVC light grey aspiration tube **(3)** (supplied with the machine) to the 30 mm Ø tube-holder **(2)** ("aspirated fluid inlet"). The other end of the same tube should be connected to the aspiration piping **(2b)** coming from the surgeries.

The black heat resistant exhaust air pipe **(4b)**, fitted with a metal spiral, must be connected to the 30 mm Ø tube-holder **(4)** ("exhaust air outlet"). Connect the other end of the pipe to the antibacterial filter **(5)**, passing preferably through a silencer **(5a)** supplied with the aspirator. The hot air coming from the antibacterial filter must be conveyed outside.

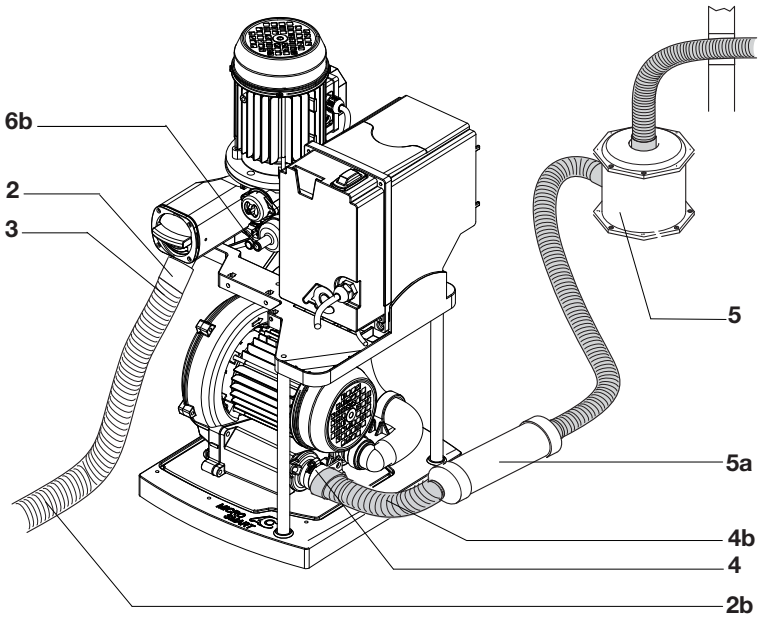
Connect the 18 mm Ø tube-holder **(6, page 31)** to the liquid drain pipe. In the version fitted with Hydrocyclone the aspirator is draining liquids by gravity and therefore fluids cannot be pumped upwards at all, and the pipe must be at the same level as, or lower than, the waste fluid outlet. The 10 mm Ø tube-holder **(8, page 30)** ("emergency drain") must be connected to the liquid drain pipe. In the version without Hydrocyclone the 11 mm Ø tube-holder **(6b)** must be connected to the liquid drain pipe. The piping connecting the machine to the aspiration and draining system should be flexible to damper the small vibrations produced by the aspirator.




The aspiration piping should be run in the floor and at a point near the aspirator it should rise about 30 cm to reach the tube-holder **(2)** (draw. A and B, page 121).

If Micro-Smart is installed at a level lower than the surgeries, the aspiration piping must not enter the centrifugal separator perpendicularly. Rather, place a few metres of piping horizontally on the same level of the machine and then connect it to the centrifugal separator inlet which is at a higher level (using a flexible pipe) (draw.B, page 121).

After the installation is completed, connect the power cable to the mains power supply according to the regulation EN 61008-1.



Finally, connect the low voltage line which connects the dental unit to the aspirator. Ascertain that the contacts on the dental unit are clean (volt-free contacts ).

- ***Starting, final testing and users instructions***

Install and connect the aspirator. Select the ON position on the switch, which is illuminated once one of the dental units has started working. At this point aspiration will start.

To check if Micro-Smart is working correctly, it is advisable to carry out the dynamic tests (see draw. E, page 124) and to consult the Micro-Smart working diagram (draw. F, page 125).

Users must be instructed on the use and routine maintenance of the new, not used, and therefore not yet contaminated, machines.

Demonstrate to users how to follow the Micro-Smart working phases on the display, to interpret danger warnings and to carry out routine maintenance using Puli-Jet plus new **(A)** - (by means of Pulse-Cleaner) **(B)** - and Antifoaming Tablets **(C)** regularly.

- ***Operation***

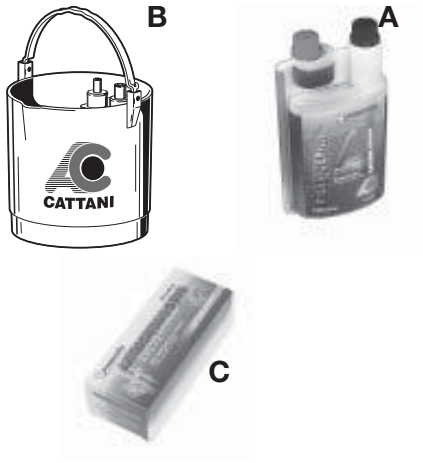
The aspirating unit **(9)** (through pipe **10**) creates vacuum inside the centrifugal separator **(11)**. The fluid coming from the dental units enters the centrifugal separator **(11)** from the pipe **(2)**.

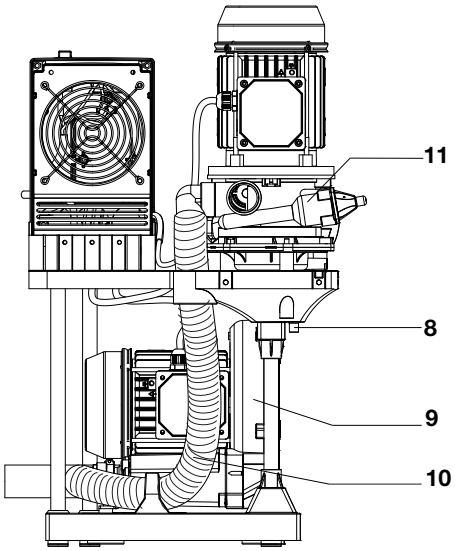
The centrifugal separator separates air from liquids: air is aspirated through to the suction motor, and then exhausted via the pipe **(4)**, whereas liquids are drained to the sewage through the waste pipe connected to the tube-holder **(6)** in the version without Hydrocyclone and to the tube-holder **(6b)** in the version with Hydrocyclone.

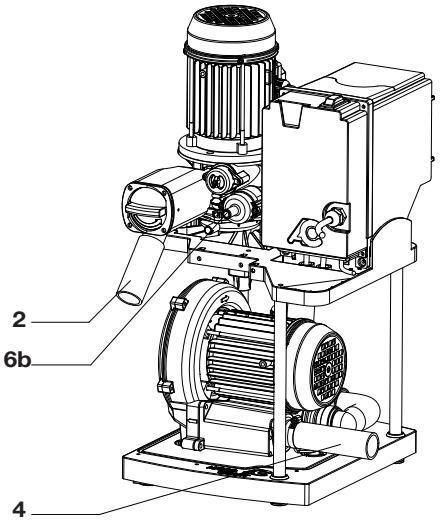
The centrifugal separator **(11)** starts before the aspirating unit **(9)**, this allows drainage of liquids that may have collected inside the centrifugal separator before aspiration starts. Moreover, when the machine is switched off, a timer (adjustable) keeps the motor running for min.10” - max. 120”.

- ***Amalgam Separator complying to the standard ISO 11143***

On request, Micro-Smart can be supplied with the amalgam separator “Hydrocyclone ISO 5,5 l/min.” having its own separate manual.



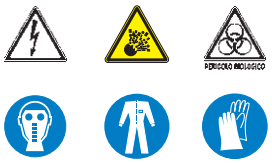



# • Routine maintenance



Routine maintenance must be entrusted to specially instructed surgery staff.

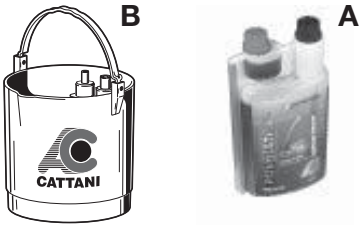
• We recommend that special attention be paid to all danger signals, and that protective goggles, gloves and disposable overalls for personal protection be used.



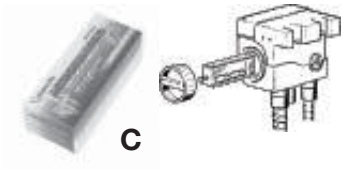

### *Daily (especially at the end of the working day and/or several times a day according to need)*

• Check for any possible alarm on the display. In case of alarms, contact the technician.

• At the end of every working day aspirate a solution of Puli-Jet plus new with anti-scale agent **(A)** disinfectant using the Pulse Cleaner **(B)**.



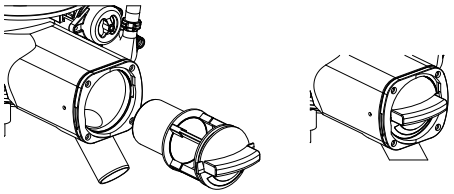

• Clean the aspiration filters on the dental unit, collect the waste, especially amalgam, according to the regulations in force and place the Disinfectant Antifoam Tablets **(C)** in the dental unit filters.




• **Disconnect the machine from the mains before any maintenance intervention.**

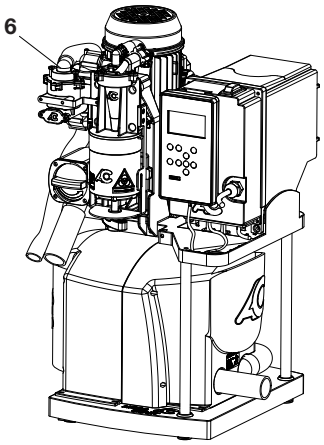
• Clean the aspirator's filter.

### *Periodically, according to need*



• Make sure that the aspirator ventilation is not obstructed.

• Keep the plant room free from anything not related to the machines, especially from flammable material. Make sure that there is no possibility for the formation of corrosive, flammable and explosive mixtures.



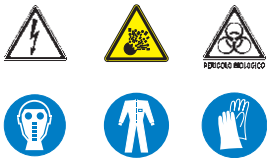
# • Extraordinary maintenance

Extraordinary maintenance must be entrusted to a trained technician in possession of original spare parts.

• Pay special attention to danger signals. Use protective goggles, gloves and disposable overalls for personal protection.

• Check that routine maintenance has been duly carried out and make sure that Magnolia products are used.

• Before any intervention carry out a series of washes with Fast&Steril 3 **(D)** disinfectant, then wait 15 minutes for a complete disinfectant action.





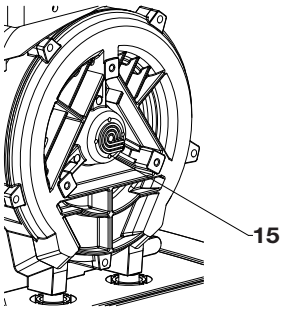

## *Recommended every 12 months **

• Check maximum detected temperatures and all alarms. Intervene accordingly.

• Where routine maintenance is not carried out properly or unsuitable products are used, train the staff and inform the person in charge. Warranty ceases in case appliances are treated with products which are different from those recommended.

• Check the aspirator noise level (see page 26).

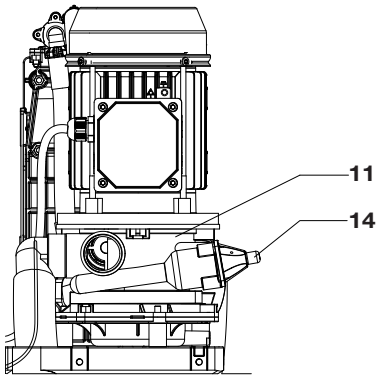
• Remove dust from the control panel's fan and heat sink using a blast of dry air not exceeding 2 bar pressure. By means of a 6 bar blast of air clean also the small holes on the frontal cover of the aspirating unit **(15)**.




## *Recommended every 18-24 months*

• Check the conditions of plastic hoses, in particular the hoses under pressure connecting the centrifugal separator **(11)** and the Hydrocyclone ISO. We suggest to replace these hoses every 18-24 months.

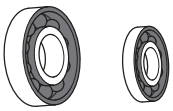
• Check the working conditions of the centrifugal separator **(11)** and re-circulation valve **(14)**.




## *Recommended every 10,000/15,000 working hours*

• Every time a component containing a rubber part ("O" ring, gasket or seal) is disassembled, replace the rubber part.

• Replace the motors bearings.



(*) Suggested maintenance intervention frequency is approximate. In case of works causing a lot of dust or particularly intensive, increase the frequency of interventions according to the needs.

# • *Instructions to navigate Micro-Smart menus and to modify some parameters*



### *Main menus*

When Micro-Smart is switched on, the display shows the Cattani logo for 10 seconds, after which time the main menu appears.

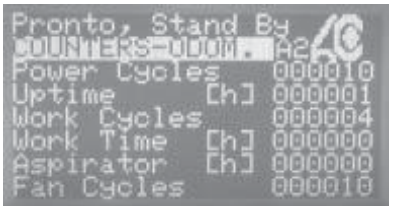

### *Main Menu "A1"*

This menu shows some parameters such as: suction motor speed, suction activation time, temperature, presence/absence of the amalgam container and system software release.


Pressing the key ⇨ takes you through

### *Control Menu "A2"*

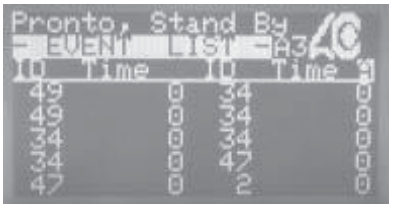
The display shows the number of times Micro-Smart has been switched on by means of the main switch (Power Cycles), the total hours Micro-Smart has had power supplied (Uptime), the number of times suction has been activated (Work Cycles), the total running hours of the aspirator (Work Time), the working hours as regards to the cycles (HZ) used and the number of times the control panel cooling fan has been activated (Fan Cycles).




Right arrow ⇨

### *Events Menu "A3"*

This menu shows the last events or alarms that have occurred to Micro-Smart. Events are indicated with a number; refer to the table at page 47 to identify them.



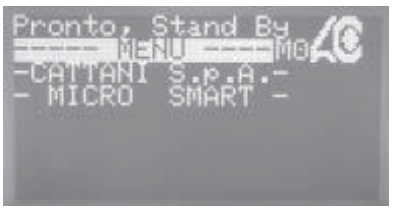

### *Control Menu "A2"*

| COUNTERS – ODOM . A2 | | |
|---|---|---|
| POWER CYCLES | 000000 | Number of times the aspirator has been switched on by means of the main switch. |
| UPTIME [ h] | 000000 | Total hours Micro-Smart has had power supplied (motors switched-off). |
| WORK CYCLES | 000000 | Number of times the aspirator has been activated by the dental unit. |
| WORK TIME [ h] | 000000 | Number of real running hours (motors running). |
| ASPIRATOR [ h] | 000000 | Working hours as regards to the cycles (HZ) used. |
| FAN CYCLES | 000000 | Number of times the control panel cooling fan has been activated. |

### *Secondary Menus*

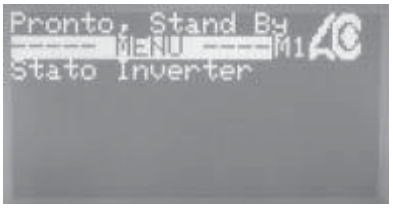
Press  to enter the Secondary Menus.

Pressing the key  takes you through the other menus.


### *Drive Status*

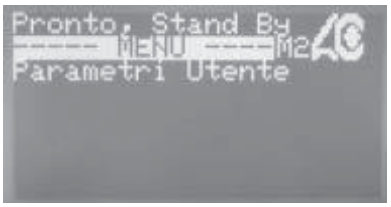
This menu can be accessed without any access password. The display shows useful information about functioning.




### *User Parameters*

Use the password 0000123000 to enter this menu.

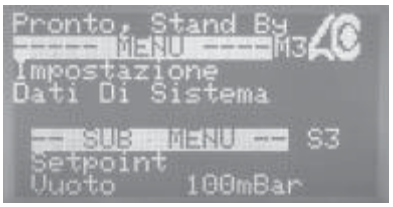
From this menu the Vacuum Set Point and the unit's displayed Language can be set.




*scroll down button*

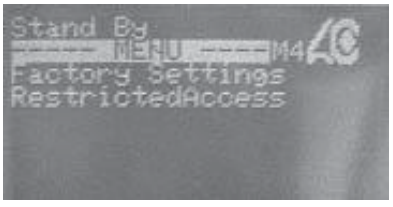
### *System Parameters Setup*

The password 0000456000 must be entered to gain access to this menu. From this menu Off Delay Time and other technical parameters can be set.




### *Factory Settings Restricted Access*

This menu cannot be accessed by the user. It can be entered by the manufacturer only.



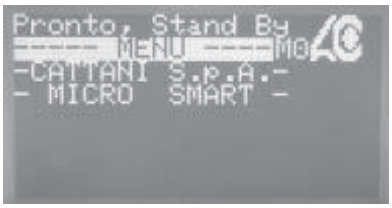
### *Entering Access Passwords*

The Drive Status menu is the only menu that can be accessed without the use of an access password.

To enter the User Parameters and System Parameters Setup menus, you must first enter an access password:

Access password for the User Parameters menu: 0000123000.

Access password for the System Parameters Setup menu: 0000456000.





From the CATTANI S.p.A. menu, press → and then ↑.

The Access Password screen Access Password 0000000000 should then be displayed.


Press the ⏻ Enter Key which will make a cursor appear on the last zero to the right.

Press ← until the cursor is flashing on the 6th zero.

Press ↑ until number 1 appears.

Press → to move to the next zero and then press ↑ until number 2 appears.

Press → to move to the next zero and then ↑ press until number 3 appears.


Press the ⏻ Enter Key to confirm the password. The cursor will disappear.

Press ← to return to the Cattani S.p.A. menu.

It is now possible to modify the parameters of the User Parameters menu.

Repeat the same process to enter the password 0000456000 to gain access to the System Parameters Setup menu.

### *Drive Status Menu*

This menu can be accessed without any access password. It displays various technical parameters regarding the real-time working conditions of Micro-Smart. Listed below is the more commonly required information.

Blower Output Frequency (max. setting: 120 Hz)

Blower Output Voltage (max. setting: 220V)

Blower Overall Current (max. setting: 4,3 A)

Pump (Centrifuge) Output Frequency (fixed setting: 75 Hz)

Pump (Centrifuge) Output Voltage (max. setting: 220V)

Pump (Centrifuge) Overall Bus Current (max. setting: 3,2 A)

System Temperature

Maximum Detected Temperature (+60 °C: Alarm and Stop of the aspirator, it can be reset)

Maximum Detected Temperature (+60 °C: Temperature memory, it cannot be reset)

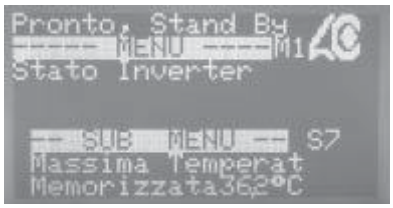
Power Bus Voltage (Max. 390V)

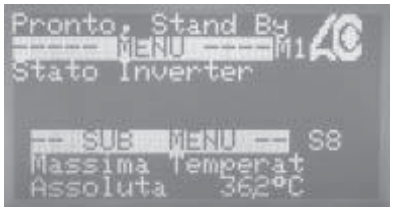
Max. Detected Power Bus Voltage (Max. 390V)

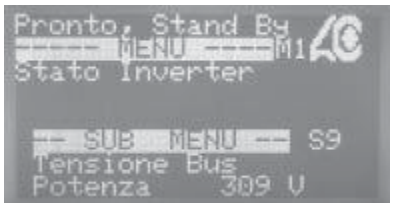
Power Bus Ripple

Vacuum Set Point (max. setting: 210 mbar)

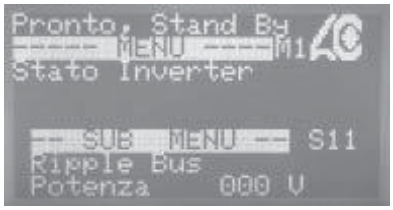
*scroll down button*

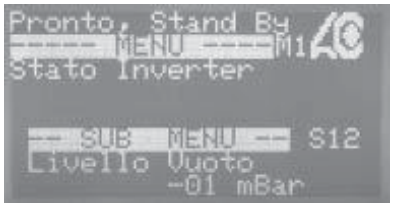







Run mode (it describes the machine's running mode)

### *User Parameters menu*

To access this menu you are required to enter the access password 0000123000 (see instructions on page 35).

Vacuum Set Point

This is the figure to which the unit will limit the vacuum.

Press the Enter Key to make the cursor appear.

The figure can be changed using the arrow keys .

Press the Enter Key again to confirm.

Language

It is possible to choose either English (1) or Italian (0), French (2), German (3) for the displayed language.

Press the Enter Key to enable the cursor and use the arrow keys to select 0 or 1 or 2 or 3.

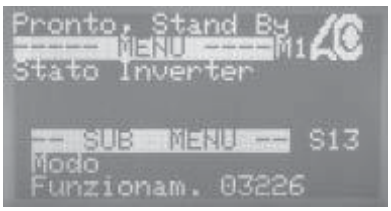
Press the Enter Key again to confirm the change.

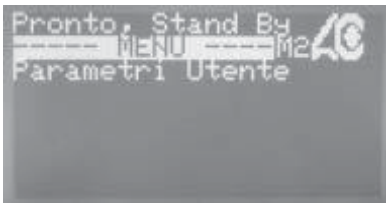
Generated Code

This code is generated by Cattani S.p.A. Each unit is allocated a unique code. At present this code is not used.

Activation Code

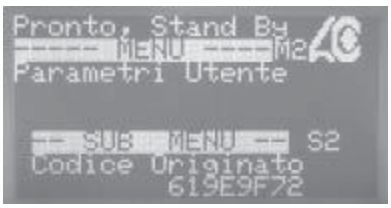
At present this code is not used.

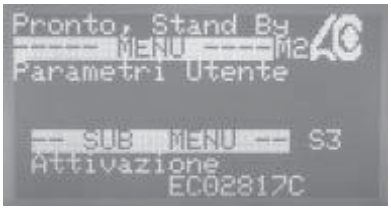




scroll down button

### *System Parameters Setup menu*

To access this menu and/or make any changes, you are required to enter the access password 0000456000 (see instructions on page 35).

To change any parameters in this menu:

Scroll with ⇧⇩ through to display the required parameter.

Press the ⏻ Enter Key to enable the cursor. The figure can be changed using the arrow keys ⇧⇩ .

Once the figure has been set to the desired figure, press the Enter Key ⏻ again to confirm and continue.

All the parameters can be regulated.

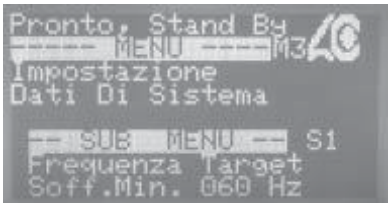
Min. Vacuum Setting

Max. Blower Output Frequency at the Min. Vacuum Setting

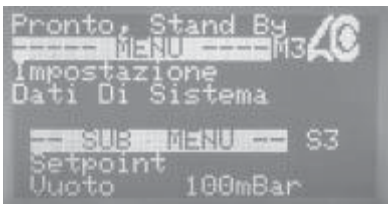
Blower Current limit at the Min. Vacuum Setting

Medium Vacuum Setting






Scroll down button

Max. Blower Output Frequency at the Medium Vacuum Setting

Blower Current limit at the Medium Setting

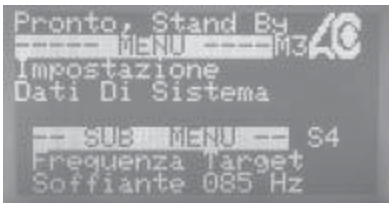
Surgery Vacuum Setting

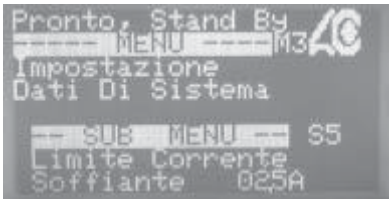
Max. Blower Output Frequency at the Surgery Vacuum Setting

Blower Current limit at the Surgery Vacuum Setting

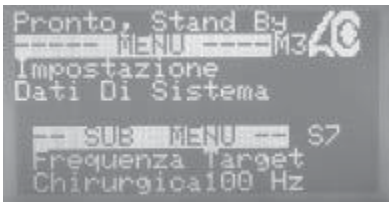
Off Delay Time (max. setting: 300”)

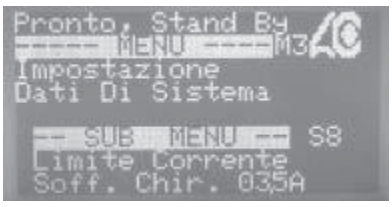
Pump Off Delay Time (max. setting: 30”)

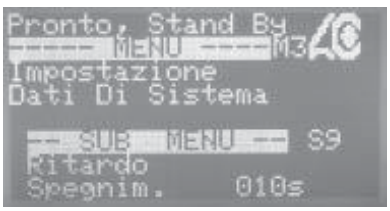



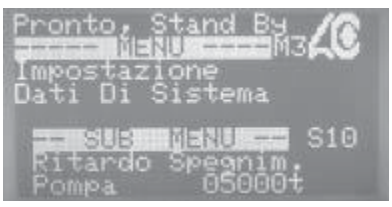







Blower Off Delay Time (max. setting: 300")

Running Options

This enables or disables the amalgam level sensor.

Set to 0: without amalgam separator

Set to 2: with amalgam separator

Drive Commands

Factory use only.

Modbus address

This menu is not currently used.

Network address

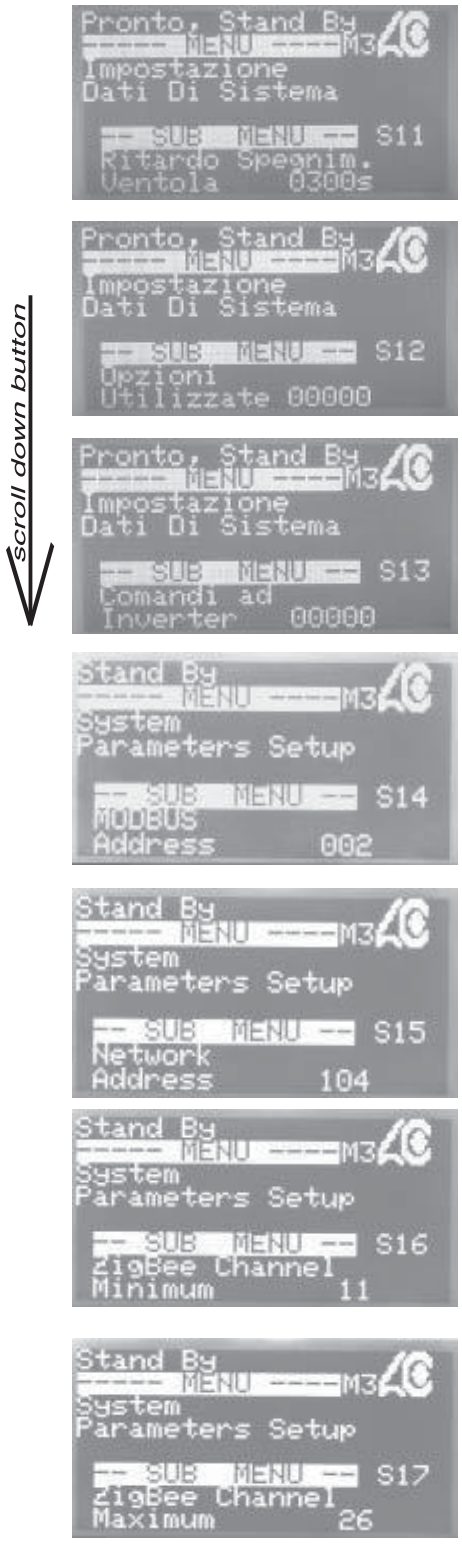
Specify the network address of the Micro SMART for Zig-Bee visualization.

Zig-Bee Minimum Channel

Select the minimum channel on which the Micro SMART shall communicate.

Zig-Bee Maximum Channel

Select the maximum channel on which the Micro SMART shall communicate.



# • *Instructions for Zig-bee communication settings (wireless)*

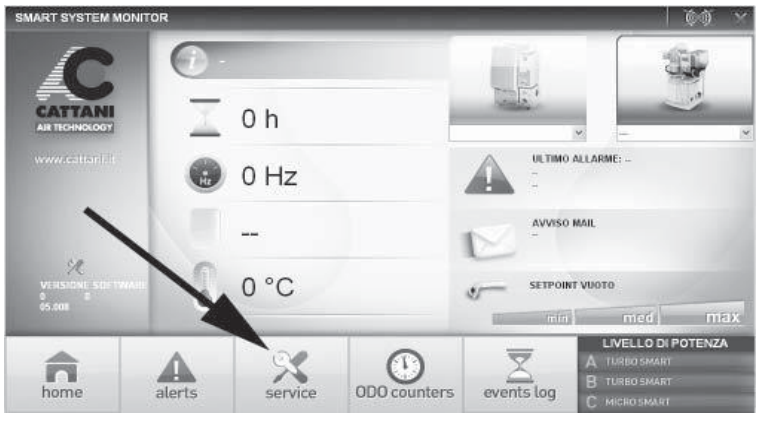
Set the network address of the machine.
(min. 100)
(max. 110)


Insert the Zig-Bee communication key (ETRX2USB) into a USB connection on the clinic computer and launch the visualization program.

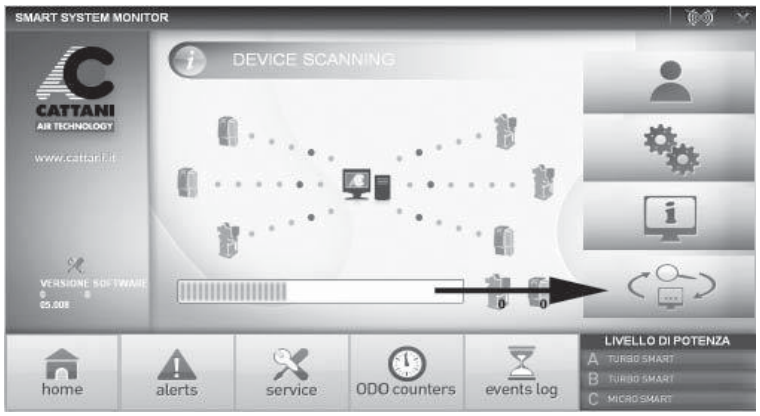

Install the 'Smart System Monitor' program supplied by Cattani Spa.


Once the program has been launched the main company screen will be displayed for around 10 seconds, after which time the main menu will appear.


Click on the 'SERVICE' menu in order to enter the device-search page.



Click on the 'search available devices' tab. The program will initiate a search, which can take several seconds. Once the search is completed, the program will display the various available units and their corresponding generated code. NB: It may be necessary to repeat this process several times.




After having found the available devices, return to the home page to view parameters.


Select which Micro SMART you wish to view, by selecting it through the drop-down menu.


It is now possible to view the operating parameters.

By clicking on the ‘SERVICE’ tab you can access three different menus, one of which is open, and the other two restricted by a passwords.


To enter the ‘USER PARAMETERS’ menu enter the password 123000 and press ‘OK’.


Through this menu you can select a different language and set the desired vacuum level.


To enter the ‘SYSTEM PARAMETERS SETUP’ menu enter the password 456000 and press ‘OK’.

Through this technical menu you can view and modify all the parameters.


The 'INVERTER STATUS' menu does not require an access password. This menu displays the functional parameters of the machine while it is in operation.


From the main menu, click on the 'E-MAIL' tab to enter the details of the technician or doctor to whom alarm alerts should be sent.


In case of malfunction an alarm will be shown on the screen and an e-mail sent to the contact entered (as per above point).

Any alarms generated through the day are displayed with an error code and description in the ‘ALERTS’ tab.


The full history of all alarms registered during the entire period of operation can be viewed through the ‘EVENTS LOG’ tab.


The operation cycles are recorded, and can be viewed by clicking on the “ODO COUNTERS’ tab.

# • *Description of alarms*



| AC100 Alarm code | DESCRIPTION | SOLUTION |
|---|---|---|
| 0 | Microcontroller memory alarm | Contact the technician |
| 32 | Microcontroller memory alarm | Contact the technician |
| 33 | Short-circuit in one of the two motors | Identify where the short-circuit is coming from and eliminate it |
| 34 | Short-circuit before the motors' starting | Contact the technician (the PC-Board is likely to be damaged) |
| 35 | Condensers have not been charged | Contact the technician (replace the PC-Board) |
| 36 | Overtemperature (temperature has exceeded the max. allowed limit) | Ventilate the plant room<br>Check operation of the cooling fan |
| 37 | Blower overcurrent (the blower has exceeded the current limit) | Check the operation of the blower (seized or excessive friction) |
| 39 | Condensers overvoltage (the condensers have exceeded the max.voltage limit) | Check the mains voltage (max. 260V) |
| 40 | Centrifuge short-circuit | Eliminate the short-circuit |
| 41 | PC-Board short-circuit on the centrifuge output | Replace the PC-Board |
| 42 | Centrifuge instant overcurrent (the centrifuge has exceeded the current limit) | Eliminate siphons in the piping or check the centrifuge operation (seized or excessive friction) |
| 43 | Centrifuge time delayed overcurrent (the centrifuge has exceeded the current limit) | Eliminate siphons in the piping or check the centrifuge operation (seized or excessive friction) |
| 45 | Amalgam level sensor disconnected | Connect the amalgam level sensor |
| 46 | Amalgam level > 95% | Replace the amalgam container as soon as possible |
| 47 | Amalgam level > 100% | Replace the amalgam container |
| 48 | The vacuum detecting tube is disconnected | Connect the vacuum detecting tube to the centrifuge |
| 49 | Thermal switch switched-off | Restore the temperature in the machine room |

# • Important notices
# • Transport and storage
# • Transport of second-hand appliances

## • *Important notices*

• Appliances are guaranteed for one year from the date of sale, provided that the warranty slip is returned to the manufacturer with date of sale, retailer's and customer's name.

• Warranty and manufacturer's liability cease in case appliances are treated with products which are unsuitable or different from those recommended by the manufacturer and also in case appliances are improperly used or tampered with operations of any kind carried out by people who are not authorized by the manufacturer.

• The manufacturer, concessionaires, agents and authorized technicians are at customers' disposal for advice and assistance and to supply literature, spare parts and anything useful.

• The manufacturer reserves the right to modify the products for improvements, for technical, normative and functional reasons or for problems due to the availability of products or semi-finished products, without prior notice.

• Our updated manuals are available at www.cattani.it. We recommend they are consulted especially for updates concerning safety.

• Micro-Smart is a EEE device, therefore it is subject to the WEEE (Waste of Electrical and Electronic Equipment) regulations.

## • *Transport and storage*

• Packed appliances can be transported and stored at a temperature ranging from -10 °C to + 60 °C.

• Packages must be kept away from water and splashing and cannot tolerate humidity >70%.

• Packages with the same weight can be stored in piles of three only.

## • *Transport of second-hand appliances*

• Before packing, we suggest to cleanse and disinfect the aspirator with Fast & Steril 3 (refer to the paragraphs "Signals and warnings" and "Routine maintenance").

• Drain all tubes and ports (including those that convey fluids from inside machine) and possible residual fluids (including disinfectant), which can damage the control panel. Remove the amalgam collection canister, add the disinfectant, place and then lock the hermetically sealed lid on the canister. Once the suction unit is dry –both externally and internally- close all of the inlets and outlets with the purpose-made caps, fit a new (and empty) amalgam collection canister to the unit, and wrap both the suction unit and control panel separately in plastic, in order to ensure that these items are waterproof.

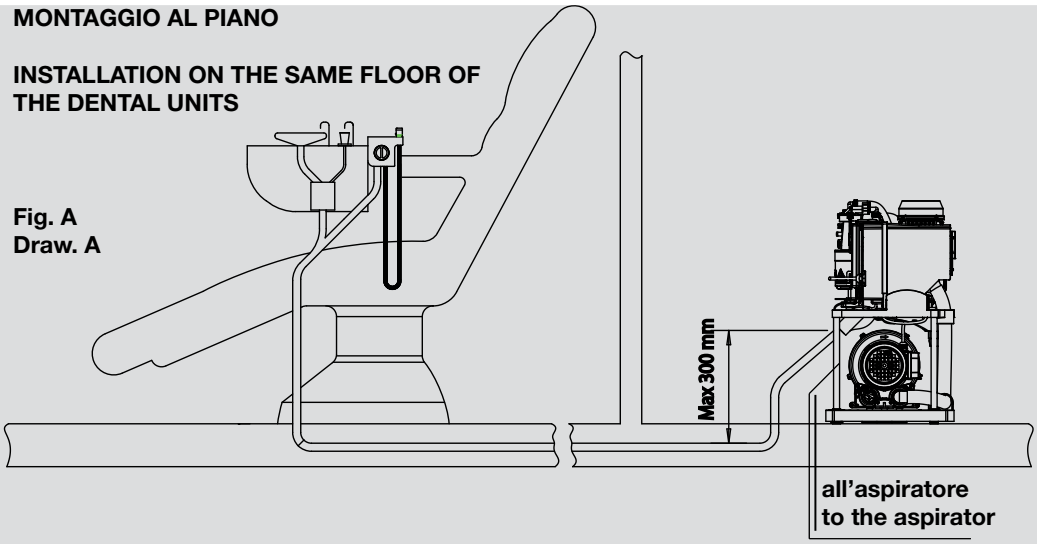
• Place the machine into a polyethylene bag, seal and pack it in 3-layer corrugated board.

# • SCHEMA DI MONTAGGIO Micro-Smart
# • Micro-Smart INSTALLATION LAYOUT

**MONTAGGIO AL PIANO**

**INSTALLATION ON THE SAME FLOOR OF THE DENTAL UNITS**

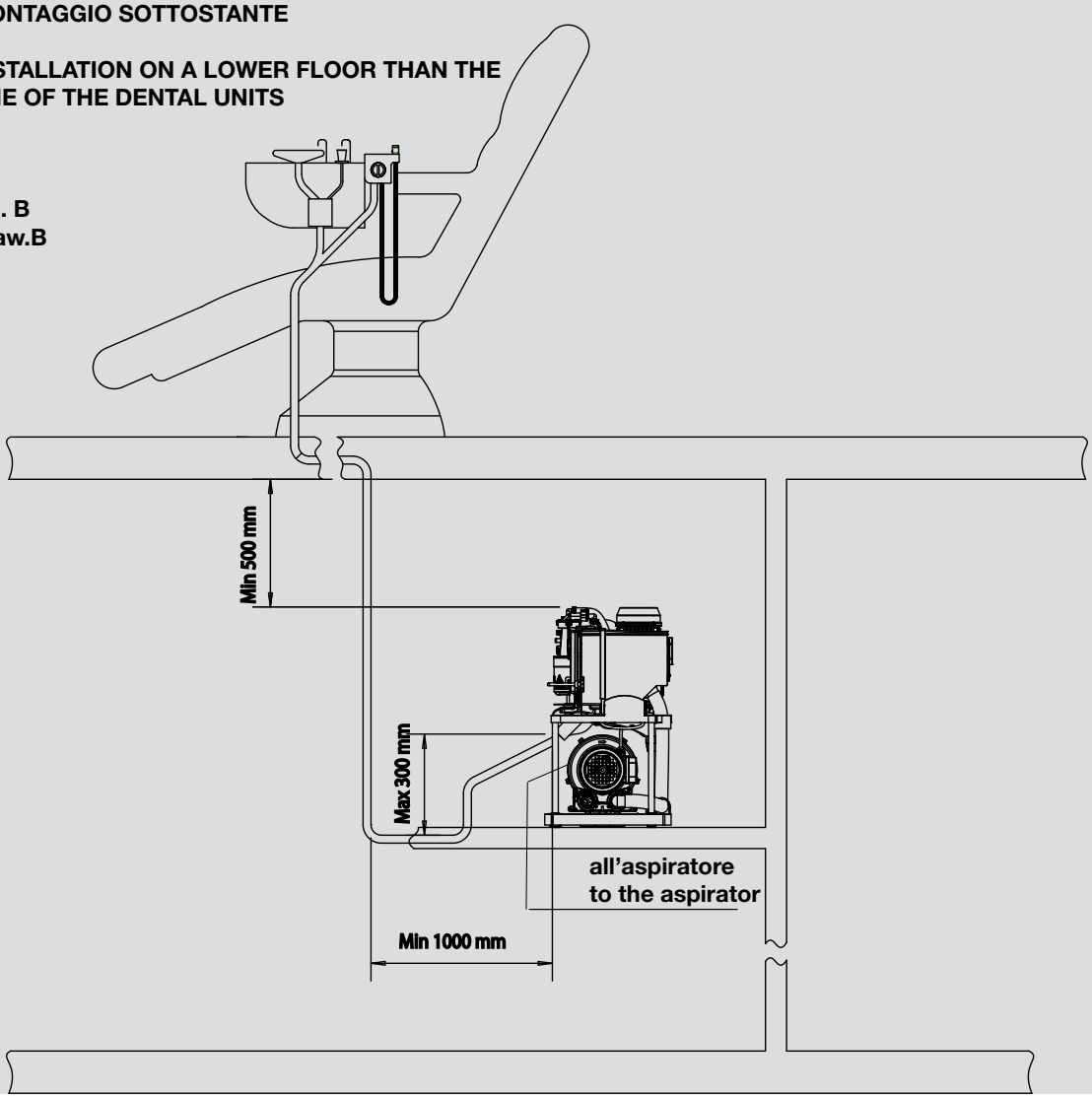
**Fig. A**
**Draw. A**




**MONTAGGIO SOTTOSTANTE**

**INSTALLATION ON A LOWER FLOOR THAN THE ONE OF THE DENTAL UNITS**

**Fig. B**
**Draw.B**



# • COLLEGAMENTI CIRCUITO INVERTER AC100
# • INVERTER AC100 CONNECTIONS

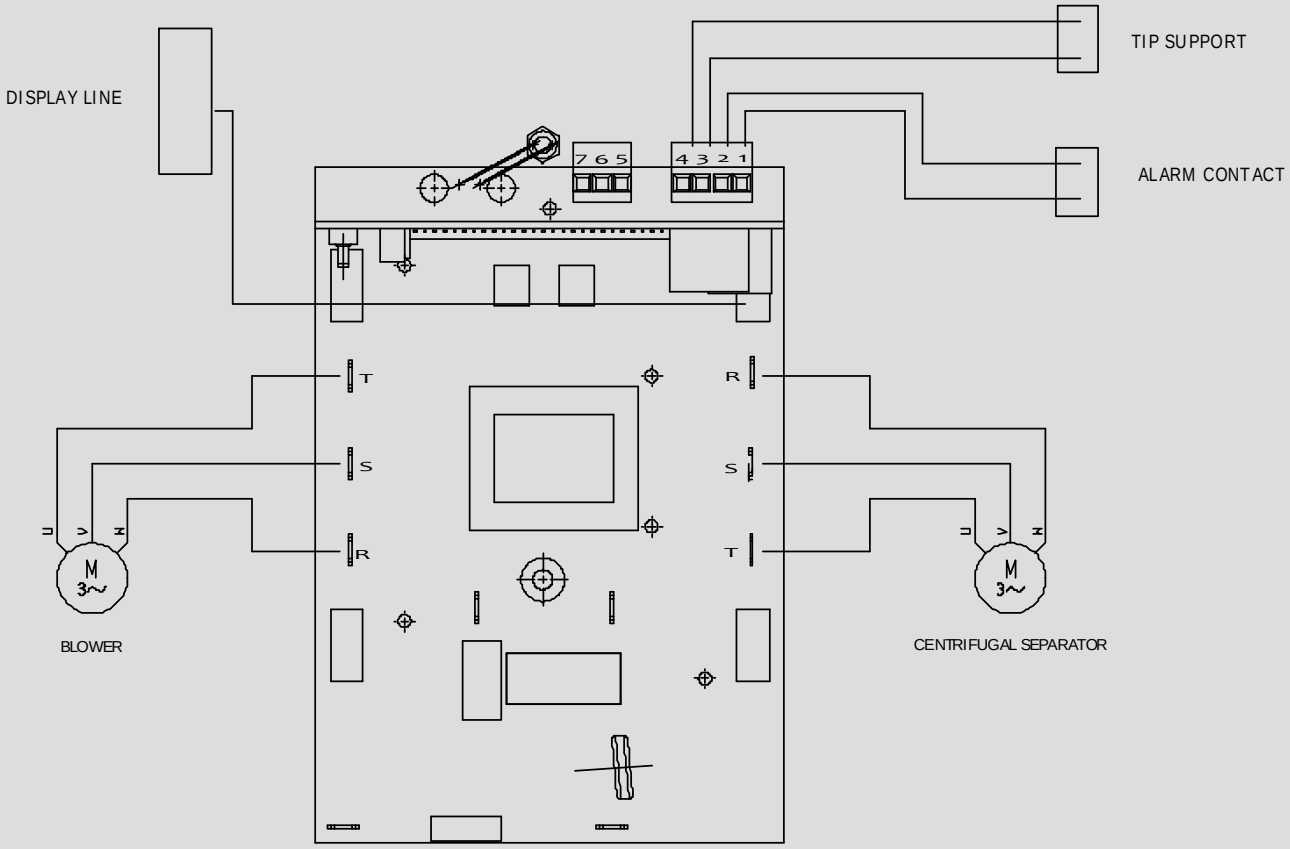



**Fig. C**

**Draw. C**

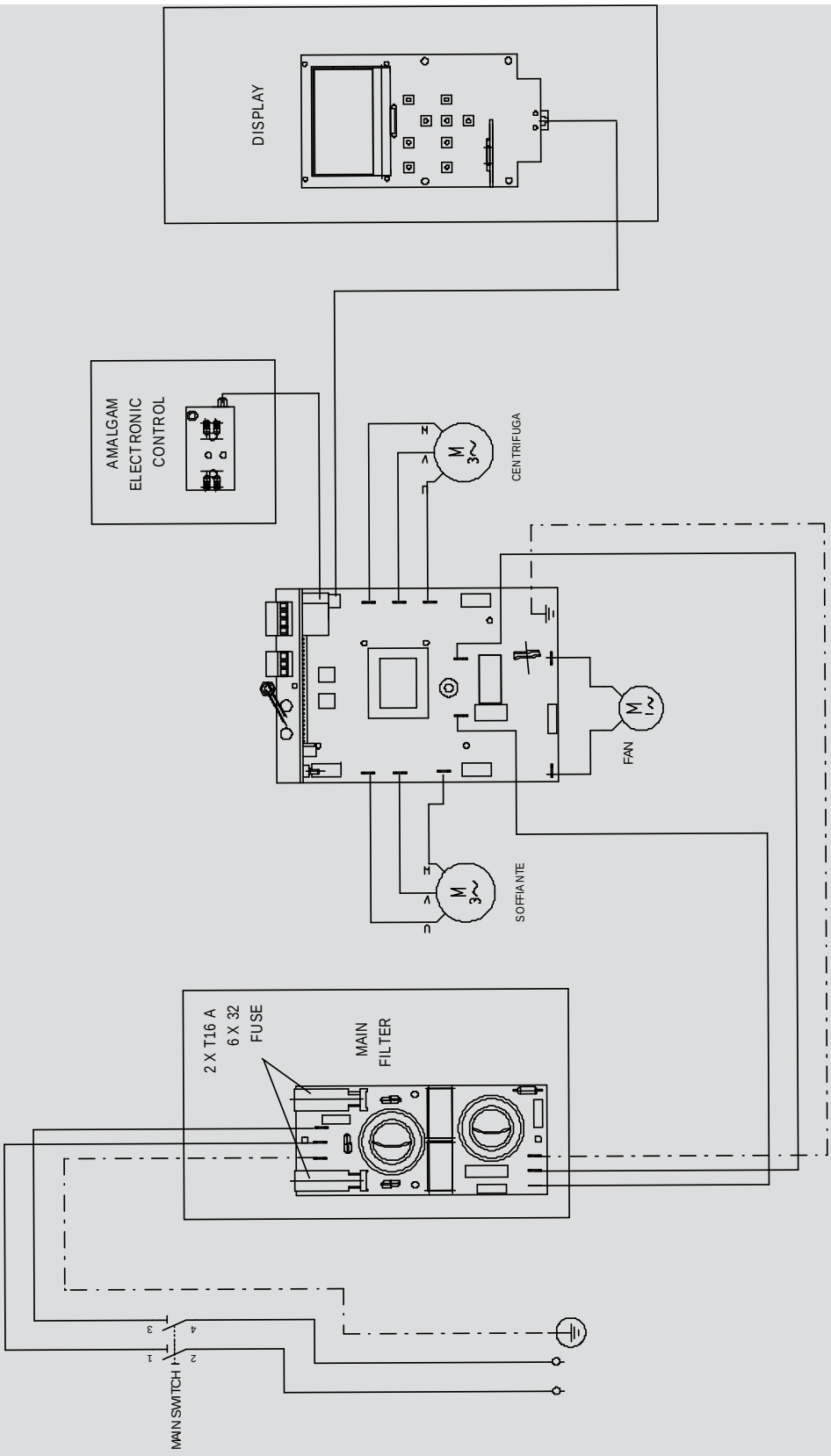

DISPLAY
AMALGAM
ELECTRONIC
CONTROL
CENTRIFUGA
FAN
SOFFIANTE
2 X T16 A
6 X 32
FUSE
MAIN
FILTER
MAIN SWITCH
1
2
3
4

**Fig. D**

**Draw. D**

# • PROVE DI DIAGNOSI SU Micro-Smart
# • DIAGNOSTIC TESTS ON Micro-Smart

Per verificare il corretto funzionamento di Micro-Smart, si possono effettuare alcuni test di tipo dinamico, di seguito esposti. Si dovrà eseguire il test a macchina in funzione e con l'ingresso d'aspirazione libero, non collegato alla tubazione.

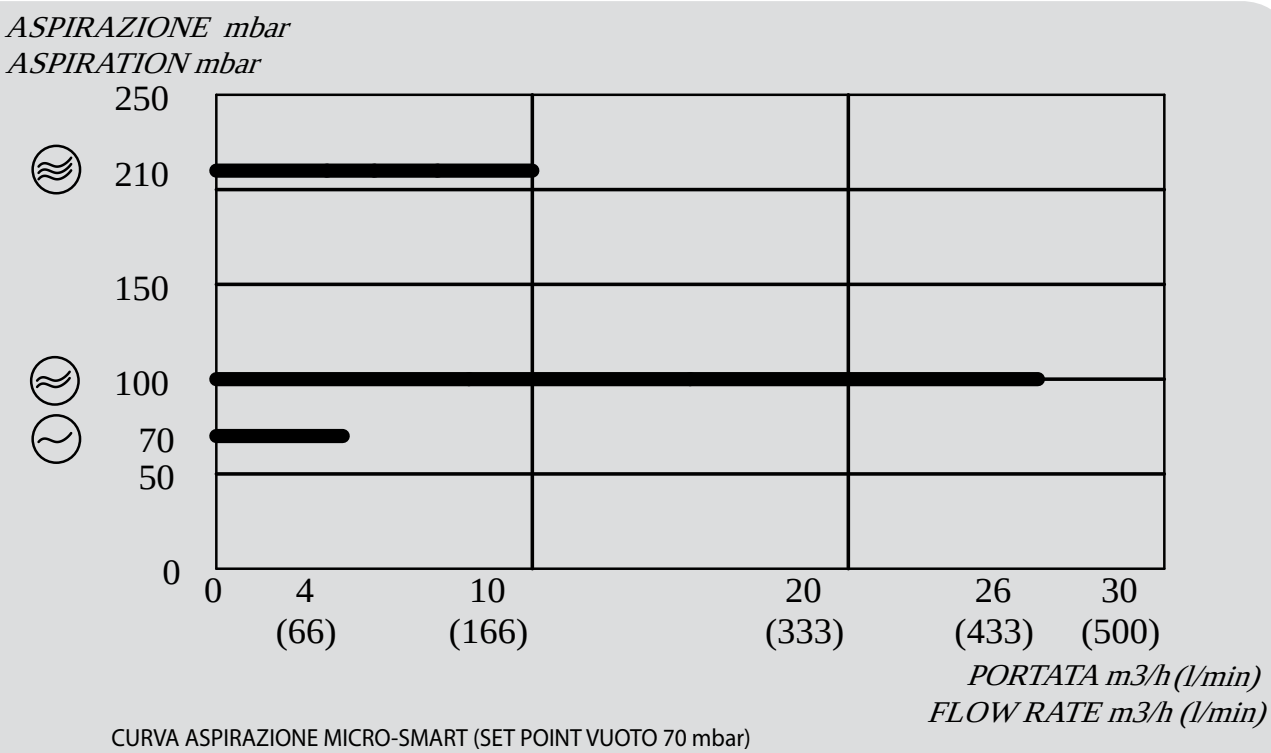
Here below you can find the description of some dynamic tests useful to check the correct working of Micro-Smart. One test must be carried out on running machines with open aspiration inlet not connected to the piping.

| | **STEP 1**<br>**(livello minimo)**<br>**(minimum setting)** | **STEP 2**<br>**(livello medio)**<br>**(medium setting)** | **STEP 3**<br>**(livello massimo)**<br>**(maximum setting)** |
|---|---|---|---|
| **Set-point livello di vuoto**<br>**Vacuum set point** | **70 mbar** | **100 mbar** | **210 mbar** |
| **Frequenza target Soffiante**<br>**Max. Blower Output Frequency** | **60 Hz** | **85 Hz** | **120 Hz** |
| **Limite "corrente" soffiante**<br>**Blower Overall Current Limit** | **2,2 A** | **2,5 A** | **4,3 A** |
| **Frequenza separatore centrifugo**<br>**Pump (Centrifuge) Output Frequency** | **75 Hz** | **75 Hz** | **75 Hz** |
| **Limite corrente separatore centrifugo**<br>**Pump (Centrifuge) Overall Bus Current Limit** | **3,5 A** | **3,5 A** | **3,5 A** |

**Fig. E**

**Draw.E**

# • DIAGRAMMA DI LAVORO DI Micro-Smart
# • Micro Smart WORKING DIAGRAM




CURVA ASPIRAZIONE MICRO-SMART (SET POINT VUOTO 70 mbar)
PREVALENZA CONSIGLIATA PER ASPIRASALIVA o ASPIRAZIONE DI FONDO BOCCA.
ASSORBIMENTO IN (A) Da 0,5 a 1 - INTERVALLO DI FREQUENZA (Hz) Da 50 a 55
*MICRO SMART ASPIRATION CURVE (VACUUM SET-POINT 70 mbar)*
*SUGGESTED MAX.HEAD FOR SALIVA EJECTOR OR MOUTH FLOOR ASPIRATION*
*ABSORPTION IN (A) from 0.5 to 1 –CYCLE RANGE (Hz) from 50 to 55*

CURVA ASPIRAZIONE MICRO-SMART (SET POINT VUOTO 100 mbar)
PREVALENZA CONSIGLIATA PER INTERCETTATORE DI SPRUZZI.
ASSORBIMENTO IN (A) Da 1,1 a 1,9 - INTERVALLO DI FREQUENZA (Hz) Da 60 a 90
*MICRO SMART ASPIRATION CURVE (VACUUM SET-POINT 100 mbar)*
*SUGGESTED MAX.HEAD FOR SPRAY INTERCEPTOR*
*ABSORPTION IN (A) from 1.1 to 1.9 –CYCLE RANGE (Hz) from 60 to 90*

CURVA ASPIRAZIONE MICRO-SMART (SET POINT VUOTO 210 mbar)
PREVALENZA CONSIGLIATA PER ASPIRAZIONE CHIRURGICA.
ASSORBIMENTO IN (A) Da 3,1 a 3,6 - INTERVALLO DI FREQUENZA (Hz) Da 95 a 105
*MICRO SMART ASPIRATION CURVE (VACUUM SET-POINT 210 mbar)*
*SUGGESTED MAX.HEAD FOR SURGICAL ASPIRATION*
*ABSORPTION IN (A) from 3.1 to 3.6 –CYCLE RANGE (Hz) from 95 to 105*

**Escludendo i tasti preselezionati, Micro-Smart può lavorare su due poltrone contemporaneamente.**

**Excluding the preset buttons, Micro-Smart can operate two chairs at the same time.**


**Fig. F**

**Draw.F**

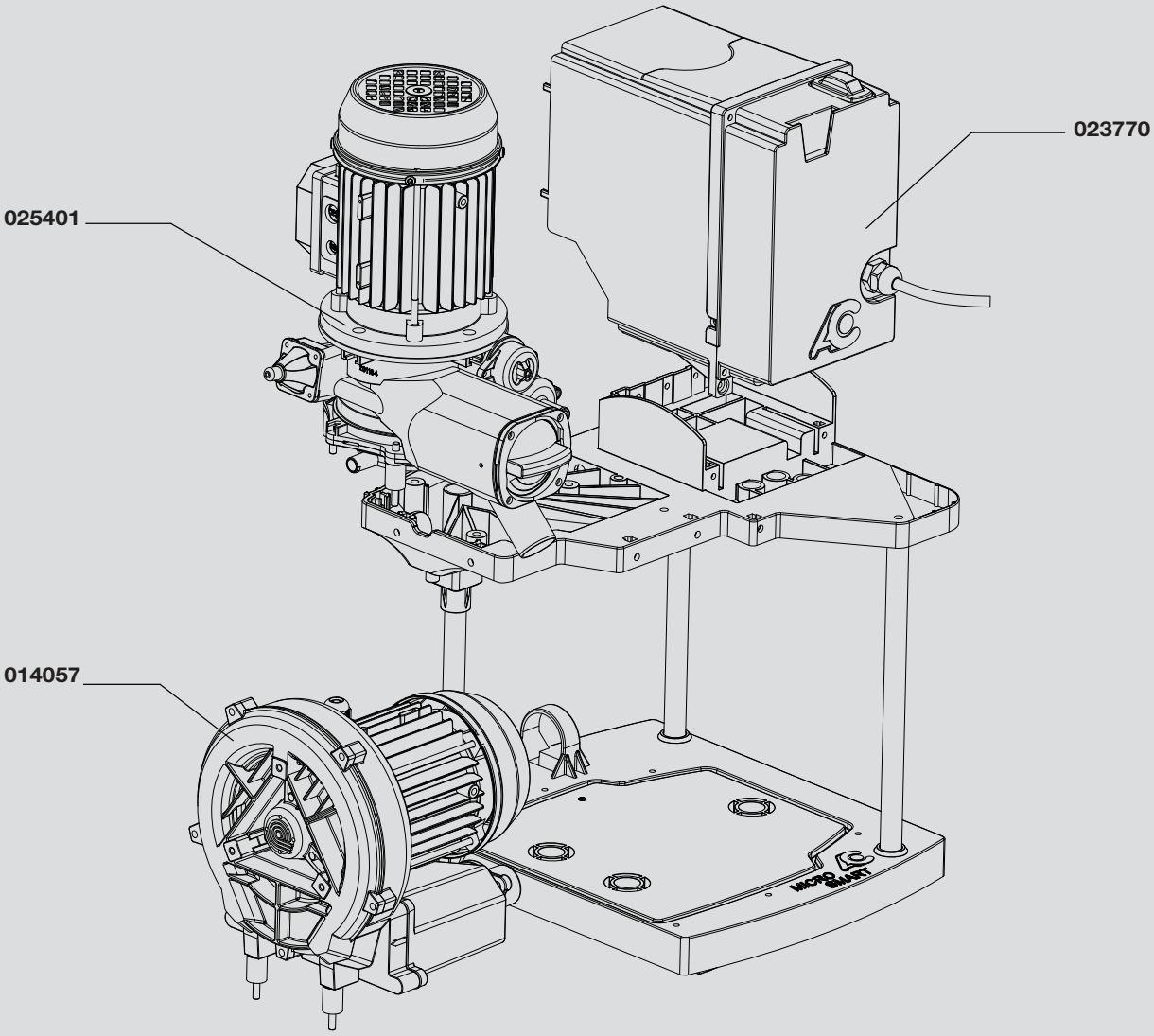



**Fig. G**

**Draw. G**

**COD. 023770 CENTRALINO ELETTRICO**

**COD. 025401 SEPARTORE CENTRIFUGO**

**COD. 014057 SOFFIANTE**

**CODE 023770 ELECTRIC CONTROL PANEL**

**CODE 025401 CENTRIFUGAL SEPARATOR**

**CODE 014057 BLOWER**

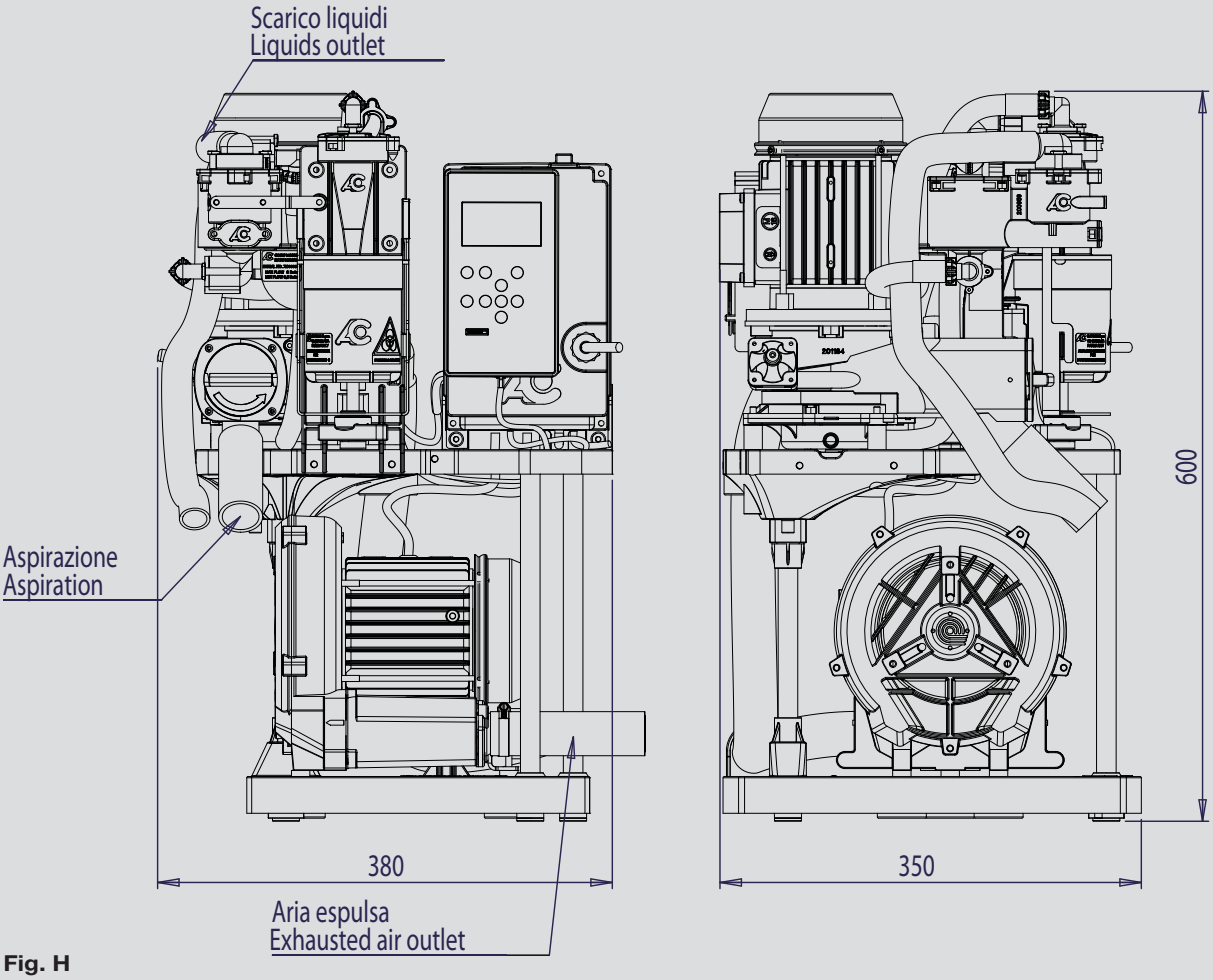

Scarico liquidi
Liquids outlet
Aspirazione
Aspiration
380
Aria espulsa
Exhausted air outlet
600
350

**Fig. H**

**Draw.H**

**HOW CAN WE DO WE LEAD IN OUR FIELD, YET WE COST LESS THAN THE ALTERNATIVES?**

THIS IS HOW:

- **WE RESEARCH:** this lets us apply the latest technology in all of our products and solutions.
- **WE INCREASE PERFORMANCE:** electronic and information technology allow us to increase the performance and reliability of our products.
- **WE REDUCE COSTS:** less maintenance and energy costs mean on a cost-benefit analysis we are always the most economical.
- **WE REDUCE ENVIRONMENTAL IMPACT:** we save 50% of primary materials, and allow you to save between 30% and 50% of electrical consumption.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Company with Quality System Certified according to
**UNI EN ISO 9001:2008 - UNI EN ISO 13485:2012**

ИМ05

*Ed. November 2014*