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

TURBO SMART

A UNIVERSAL ASPIRATOR

CATTANI
AIR TECHNOLOGY

ITALIANO

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AIR TECHNOLOGY

TURBO SMART

A UNIVERSAL ASPIRATOR

INDICE

• *Dati generali di funzionamento 50/60 Hz Aspiratore ad uso dentistico Turbo-Smart*

Modello	Turbo-Smart “A”		Turbo-Smart “B”	
Tensione nominale	230 V ~		230 V ~	
Frequenza nominale	50/60 Hz		50/60 Hz	
Corrente nominale	7 A		9 A	
Modalità di impiego	Funzionamento continuo		Funzionamento continuo	
Protezione contro l’umidità	Comune		Comune	
Potenza massima assorbita	1,45 kW		1,87 kW	
Portata massima	86 m³/h		105 m³/h	
Prevalenza massima per il servizio continuo	2000 mm H_2O		2000 mm H_2O	
Velocità di rotazione	70 hz	85 hz	70 hz	110 hz
Pressione sonora versione scarenata	68,4 dB(A)	69 dB(A)	68,4 dB(A)	73,7 dB(A)
Pressione sonora versione carenata in plastica	66,4 dB(A)	67 dB(A)	66,4 dB(A)	72 dB(A)
Pressione sonora versione carenata per interno	48,5 dB(A)	49,5 dB(A)	48,5 dB(A)	52,2 dB(A)
Pressione sonora versione carenata per esterno	54 dB(A)	55 dB(A)	54 dB(A)	58,7 dB(A)

~	Corrente alternata	IEC 417-5032
⏚	Terra di protezione	IEC 417-5019
	Grado di protezione contro i contatti diretti o indiretti	IEC 60204-1
○	Aperto (sconnessione dalla rete di alimentazione)	IEC 417-5008
I	Chiuso (connessione alla rete di alimentazione)	IEC 417-5007

Livello di pressione sonora rilevato secondo la norma ISO 3746-1979 (E).
Parametri: r = 1,5 - rumore di fondo: 34 dB(A) - strumento Bruel & Kjaer type 2232.

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TURBO SMART

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INDEX

• *General 50/60 Hz running data Turbo-Smart dental aspirator*

Model	Turbo-Smart “A”	Turbo-Smart “B”
Rated voltage	230 V ~	230 V ~
Rated frequency	50/60 Hz	50/60 Hz
Rated current	7 A	9 A
Operating conditions	Continuous operation	Continuous operation
Protection against ingress of liquids	Ordinary	Ordinary
Max. absorbed power	1,45 kW	1,87 kW
Max. flow	86 m^3/h	105 m^3/h
Max. head for continuous service	2000 mm H_2O	2000 mm H_2O
Rotation speed	70 Hz 85 Hz	70 Hz 110 Hz
Sound pressure version without box	68.4 dB(A) 69 dB(A)	68.4 dB(A) 73.7 dB(A)
Sound pressure version with plastic box	66.4 dB(A) 67 dB(A)	66.4 dB(A) 72 dB(A)
Sound pressure level version with box for indoor installation	48.5dB(A)49.5dB(A)	48.5 dB(A) 52.2 dB(A)
Sound pressure level version with box for outdoor installation	54 dB(A) 55 dB(A)	54 dB(A) 58.7 dB(A)

~	Alternating current	IEC 417-5032
⏚	Earthing	IEC 417-5019
	Degree of protection against electric shock	IEC 60204-1
○	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 starting of the appliance.

It also informs of possible dangers and about the precautions to be taken for accident prevention.

This manual should be always available for consultation during unpacking, use, installation and starting of Turbo-Smart.

Our **updated** manuals are available on the web site **www.cattani.it.** We recommend their consultation especially for updates about **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 our efforts, it is still possible that danger warnings are not exhaustive: we apologise to the users and kindly request them to care for all danger sources that might have passed unnoticed and to inform us accordingly.

• Installation and starting

• Recommended precautions

Before unpacking the appliance, check the warning shock-watch on the carton. In case of it being red or the carton being damaged, accept the material 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.

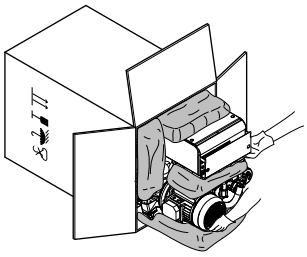
The machine installation must be carried out by a specialist equipped with the necessary tools. Install the appliance in a clean location, far from heat sources, humidity and dust. Turbo-Smart can be installed outdoors (on a balcony, in veranda or gardens), provided that it is sheltered from rain, splashing,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

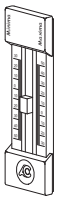
For outdoor installation we recommend the use of our special designed box fitted with double isolating roof, anti-freeze and ventilation systems (both fitted with fixed thermostat for automatic temperature control).

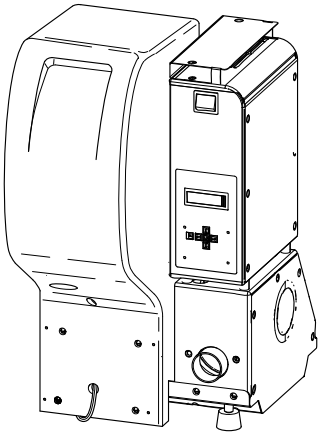
In the plant room temperature can range from a minimum of + 5 °C to +35 °C max.

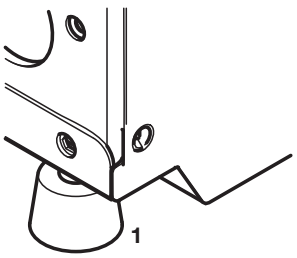
Turbo-Smart fitted with box, for indoors our outdoors installation, can be supplied with antifreeze device. In case the plant room must be ventilated or air-conditioned, we suggest to contact a thermo-technician for a personalized project. The plant room must be closed to patients and extraneous people. 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 or the possibility (unlikely but not excludible) of fire, explosion and contaminating air or liquid leakage. Use indoors and outdoors boxes designed and produced by the manufacturer of the machines only.

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. 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 present. Light coloured, wooden, linoleum, rubber or marble floors can change colour or get 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.





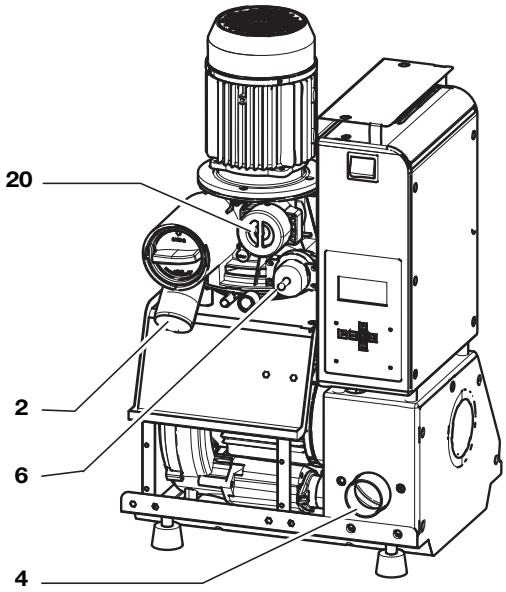




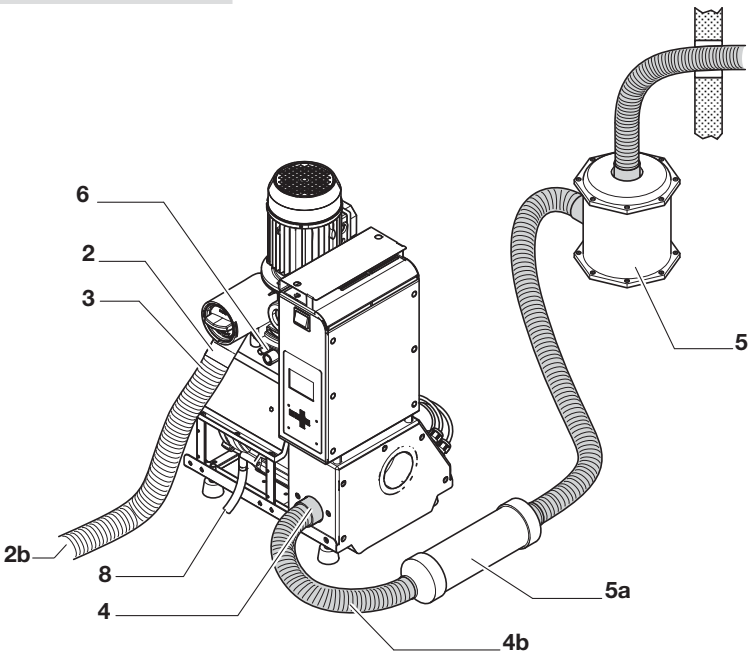
• *Installation*

Before connecting the aspirator to the piping of the centralized system, ascertain that aspiration piping is clean as heavy debris could damage the appliances.
Connect the PVC light grey aspiration tube **(2b)** (supplied with the machine) to the 50 mm Ø tube-holder **(2)** ("aspirated fluid inlet").
The other end of the same tube must be connected to the aspiration piping **(3)** coming from the surgeries (page 30).

The black heat resistant exhaust air pipe **(4b)**, fitted with a metal spiral, must be connected to the 50 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)** to the liquid drain pipe. In the version fitted with Hydrocyclone the aspirator is draining liquids by gravity, therefore these can never be drained towards the top. The 10 mm Ø tube-holder **(8)** ("emergency drain") 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)** (fig. A and B, page 121).



If Turbo-Smart is installed on a lower floor than the dental units, 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 install it at the centrifugal separator inlet which is on a higher level (use a flexible pipe) (fig.B, page 121). The aspirated fluid is reaspirated by Turbo-Smart.
After the installation, connect the power cable to the mains according to the regulation EN 61008-1.
Finally connect the low voltage users line: the clamps 19 and 20 of the circuit AC80-07 (fig. C "AC80-07 wiring diagram", page 122) to the users line **(12)** (det.12, page 30 and fig. F, page 125) which is feeding all the dental units of the same system with connections in parallel.
Ascertain that the contact on the dental unit is clean (free contact without voltage).



- ***Installation in parallel***

It is advisable to install in parallel only machines with the same flow and head values. With the installation of 2 or 3 Turbo-Smart units in parallel (fig. F) the total flow is doubled or tripled, provided that the diameter of the main piping is increased of 10 mm for each additional aspirator unit. In the same way the diameter of the exhaust air pipe must be increased. Turbo-Smart is supplied complete with all the accessories which are necessary for the installation in parallel, therefore no one-way valves, supplementary control panels or peripheral units are needed. After connecting 2 or 3 Turbo-Smart units in parallel to the same main piping, connect in parallel the users wires **(12)** coming from the different dental units. Installing Turbo-Smart units in parallel, pay attention not to invert the small cables of the connection no.19 with the small cables of the connection no.20 (fig. C, page 122). With multiple aspirators in parallel it can occur that one unit stops and that the operators do not notice it. In order to bring this to the clinic staff's attention, the connections 8 and 9 of the control panel (clean contact) (fig. C, page 122) allow a remote alarm signal to be connected in a room under frequent control. More Turbo-Smart units in parallel can offer better performance and allow the clinic to save energy when they are working simultaneously, independent of the suction demand. Disconnecting one or more aspirators doesn't result in a saving of energy and also decreases the suction power of the other machines.

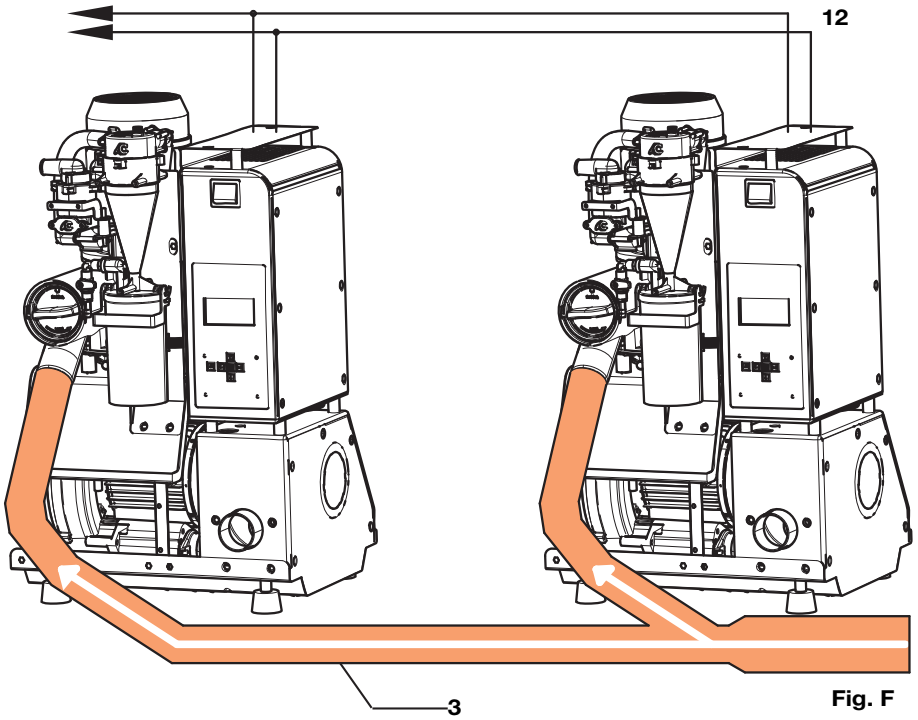
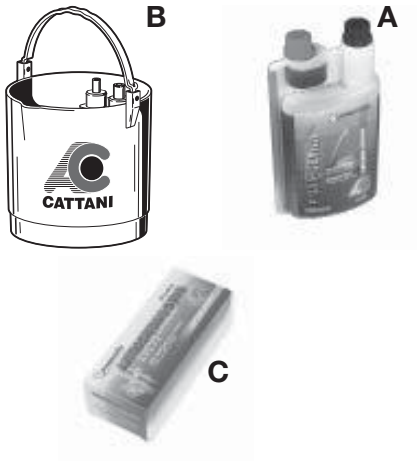


Fig. F

Draw. F

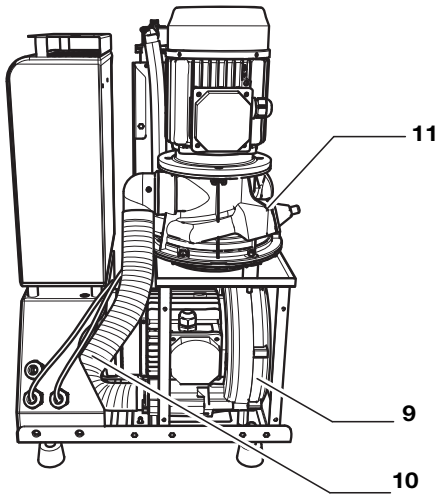
Starting, final test and users instruction

Install and connect the aspirator, select the position ON on the switch, which will light up after one of the dental units has started working. At this point aspiration will start.To check if Turbo-Smart is working correctly, it is advisable to carry out the dynamic tests (see fig. D, page 123 and the Turbo-Smart working diagram fig. E, page 124). Users must be instructed on the aspirator use and routine maintenance of new, not used, and therefore not yet contaminated, machines. Show users how to follow the Turbo-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)**.



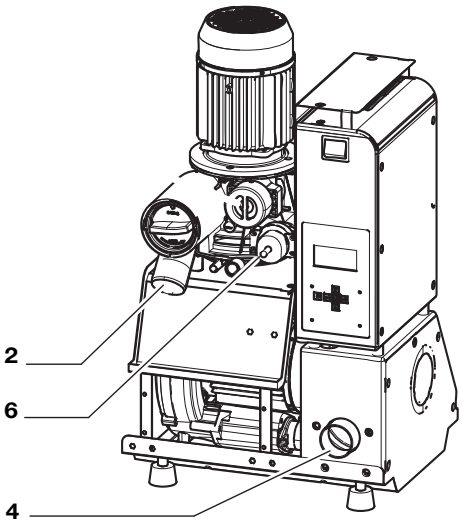
Working

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 collecting pipe **(2)**. The centrifugal separator separates air from liquids: air is exhausted outside through the pipe **(4)** whereas liquids (in the version without amalgam separator) are drained to the sewage through the waste pipe connected to the tube-holder **(6)**. The centrifugal separator **(11)** is starting before the aspirating unit **(9)**, this allows to drain the liquids which might collect inside the centrifugal separator before aspiration starts. Moreover, when the machine is switched off a timer (adjustable) is keeping the motor running for min.10” - max. 120”.



Amalgam Separator ISO 18

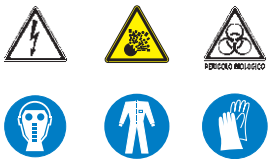
On request, Turbo-Smart can be supplied with the amalgam separator “Hydrocyclone ISO 18” having its separate manual.



• Routine maintenance

Routine maintenance must be entrusted to specially instructed surgery staff.

• We recommend to pay special attention to all danger signals and to use goggles, gloves and disposable overalls for personal protection.

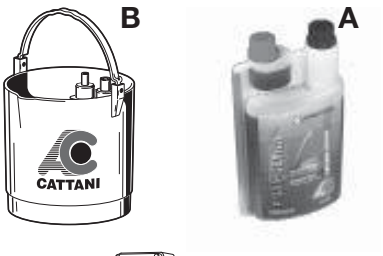


Daily

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

Every evening

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



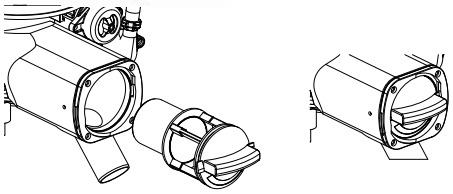
• Disconnect the machine from the mains before any intervention.

Daily

• Place the Antifoam Tablets on the dental unit filters.

Periodically

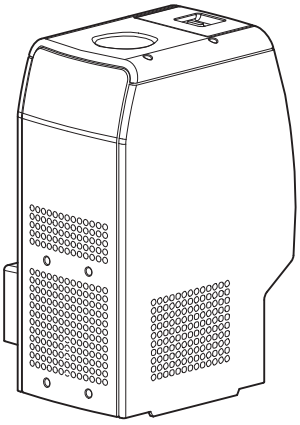
• Keep the aspirator filter clean.



Occasionally

• 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.



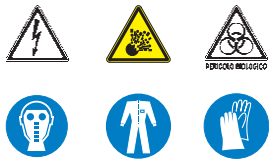
• Extraordinary maintenance

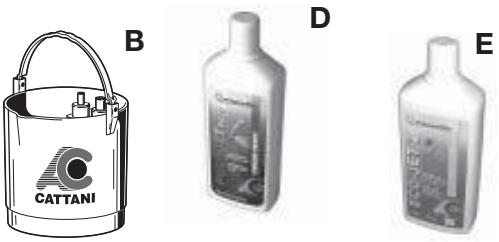
Extraordinary maintenance must be entrusted to a trained technician in possession of original spare parts:

• pay special attention to danger signals. Use 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 Eco-Jet 2 disinfectant **(E)**, then wait 10 minutes for a complete disinfectant action.





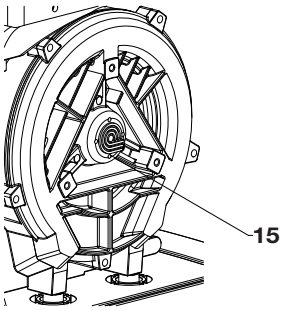
Every 12 months

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

• check the aspirator noise level (max. 72 dB according to the regulation 3047 (E);

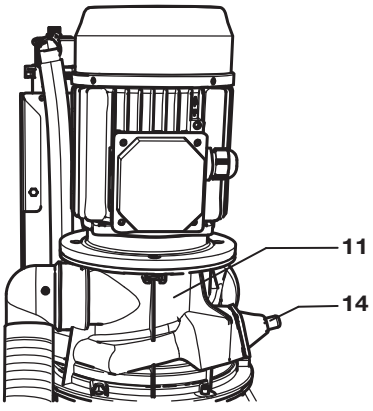
• if necessary, remove dust from the circuit AC80 inside electronic components using a blast of dry air not exceeding 2 bar pressure. By means of a 6 bar blast of air clean also the small holes on the frontal cover of the aspirating unit **(15)**;

• check the conditions of plastic hoses, in particular the hoses under pressure connecting the centrifugal separator and the Hydrocyclone ISO. We suggest to replace these hoses every 12-18 months.



Every 18-24 months

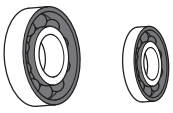
• Check the working conditions of the centrifugal separator **(11)** and re-circulation valve **(14)**.



Every 10.000 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;



• where routine maintenance is not carried out properly or unsuitable products are used, train the staff and inform the person in charge.

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

Main menus

When Turbo-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: cycles, suction activation time, temperature, presence/absence of the amalgam container and system software release.

Control Menu "A2"

The display shows the number of times Turbo-Smart has been switched on by means of the main switch (Power Cycles), the total hours Turbo-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 average working hours of the blower (Aspirator) and the number of times the control panel cooling fan has been activated (Fan Cycles).

Events Menu "A3"

The menu shows the last 10 events or alarms that have occurred to Turbo-Smart. Alarms are indicated with a number; refer to the table at page 46 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 Turbo-Smart has had power supplied.
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	Average working hours of the aspiration motor (UNI-JET 75).
FAN CYCLES	000000	Number of times the control panel cooling fan has been activated.

Secondary Menus

Press (I) 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 the Turbo-Smart 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, as well the Activation Code can be entered to upgrade version A to version B.

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.

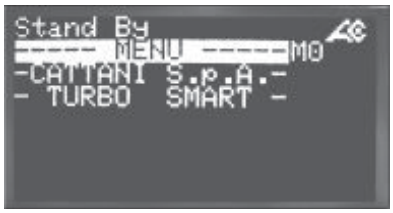
scroll down button

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 menu the access password is 0000123000.

To enter the System Parameters Setup menu the access password is 0000456000.



From the CATTANI S.p.A. menu, press ⇨ and then ⇧.

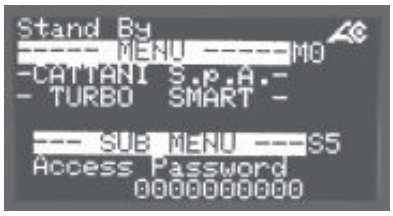
The Access Password screen Access Password 0000000000 should then be displayed.

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 and 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 Turbo-Smart. Listed below is the more commonly required information.

Blower Output Frequency

(max. setting for version A: 85 Hz

max. setting for version B: 110 Hz)

Blower Output Voltage

(max. setting: 220V)

Blower Overall Current

(max. setting for version A: 5,5 A

max. setting for version B: 7,5 A)

Pump (Centrifuge) Output Frequency

(fixed setting for versions A and B: 55 Hz)

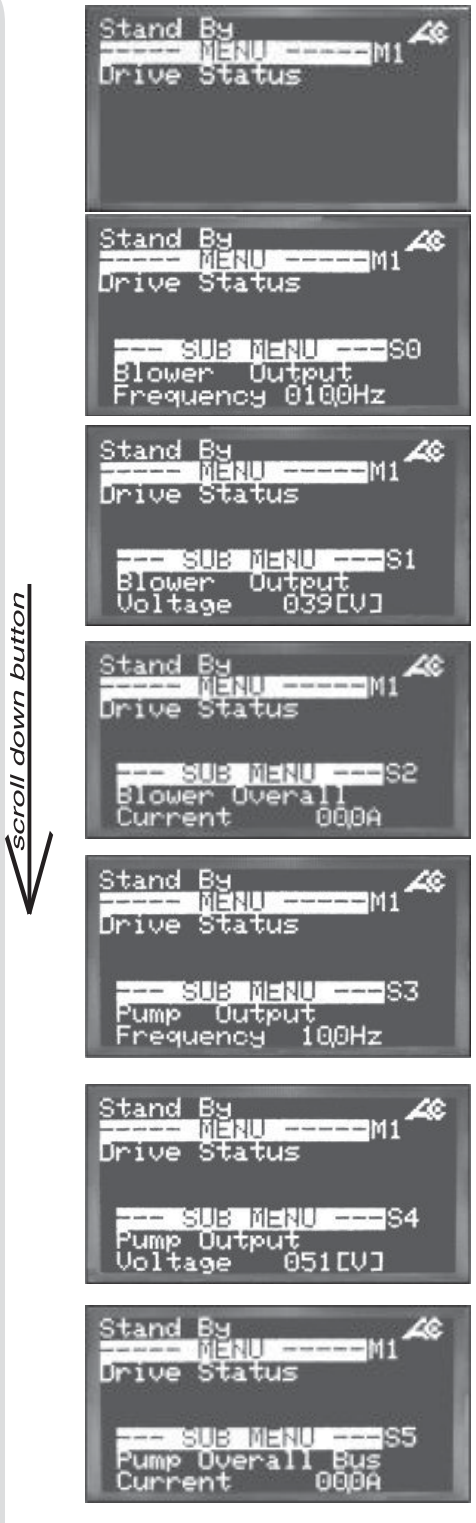
Pump (Centrifuge) Output Voltage

(max. setting: 220V)

Pump (Centrifuge) Overall Bus Current

(max. setting for version A: 5,5 A

max. setting for version B: 7 A)



System Temperature

Maximum Detected Temperature

(+58 °C: Alarm and Stop of the aspirator)

Vacuum

(max. setting: 200 mbar)

User Parameters menu

To access this menu you are required to enter the access password 0000123000 (see instructions on page 36).

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 and continue.

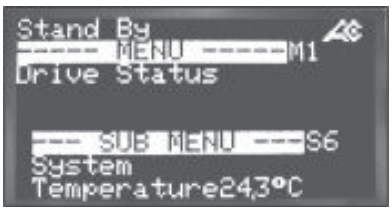
Language

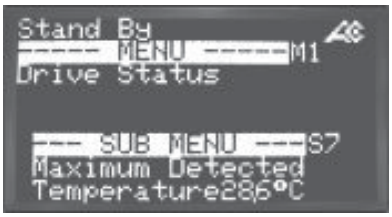
It is possible to choose either English (1) or Italian (0) for the displayed language.

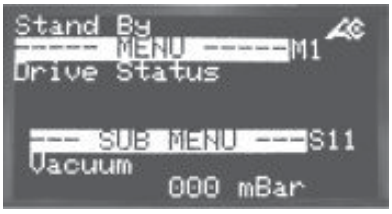
Press the Enter Key to enable the cursor and use the arrow keys to select 0 or 1.

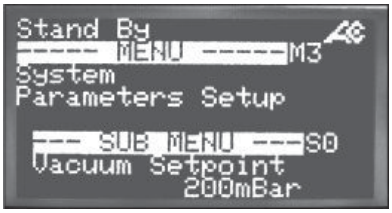
Press the Enter Key again to confirm the change and continue.

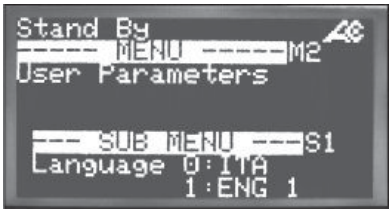
Scroll down button





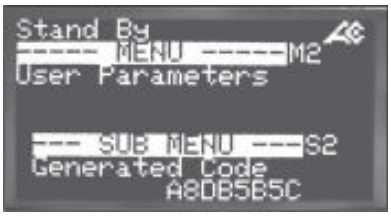






Generated Code

This code is generated by Cattani S.p.A. Each unit is allocated a unique code. This code needs to be supplied to Cattani to purchase the password (Activation Code) to upgrade version A (2 chair unit) to version B (4 chair unit).



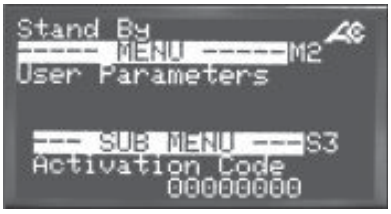
Activation Code

Once purchased from Cattani S.p.A., this code is entered at this point to upgrade version A (2 chair unit) to version B (4 chair unit).

Press the Enter Key to make the cursor appear.

Use the keys to move the cursor. Enter the Activation Code using the keys to increase or decrease the figure.

Press the Enter Key again to confirm, then press to go back to the User Parameters menu.



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 36).

Vacuum set point

(Max.setting: 200 mbar)

scroll down button

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.

Blower Current Limit

(Max. setting for A: 5,5 A

Max. setting for B: 7,5 A)

Turbo-Smart Off Delay Time

(Max. setting: 300 sec.

Min. setting: 10 sec.)

Pump (Centrifuge) Off Delay Time

(Max. setting: 30 sec.

Min. setting: 5 sec.)

Control Panel Fan Off Delay Time

(Default setting: 300 sec.

Max. setting 1800 sec.)

Running Options

This enables or disables the amalgam level sensor.

Set to 0: without amalgam separator

Set to 1: with amalgam separator

Drive Commands

Factory use only.

• *Instructions for communication settings Zigbee (wireless)*

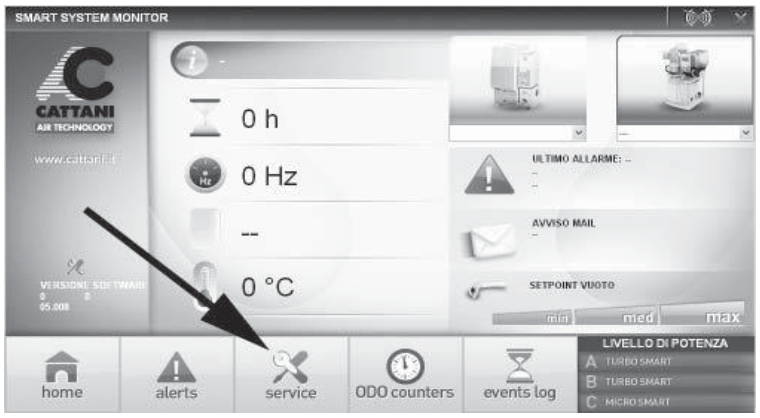
Set the network address of the machine (min 100) (max 110).

Enter the Zig-bee communication key (ETRX2 USB) in the USB port of the computer and launch the display program.

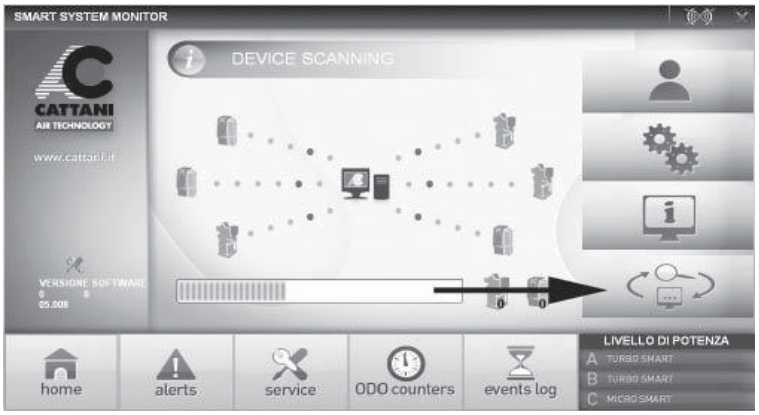
Install the SMART SYSTEM MONITOR program (supplied by Cattani) in the computer.

Once the program is launched, the company's logo will appear for 10 seconds followed by the main menu.

Click on the SERVICE menu so that you can access the device search page.

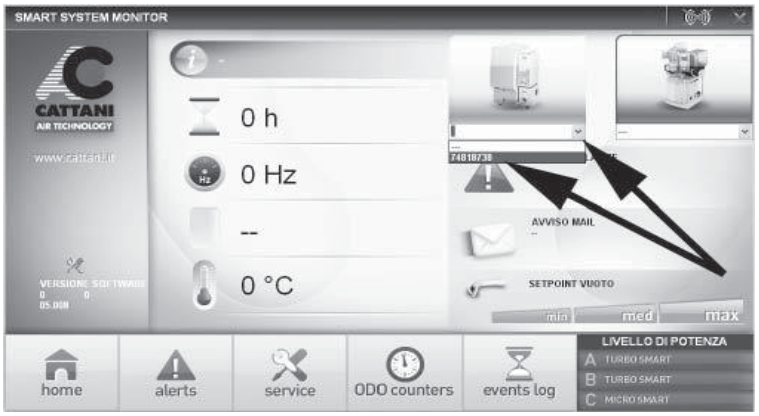


Click on available device search, the program will start the search and the operation may require a few seconds.
When completed, you will be able to view the various machines available and their generated code; you may need to repeat this operation a number of times.

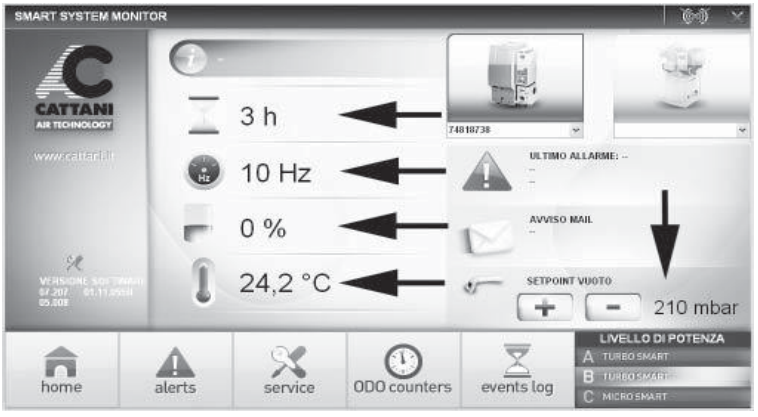


Once the program has detected the available devices, you will have to go back to home page in order to view the parameters.

Use the dropdown menu to choose which Turbo Smart you want to view.



the functional parameters of the Turbo Smart will then be displayed.



Clicking on the SERVICE icon gives access to three different menus, an open one and 2 protected by password.

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

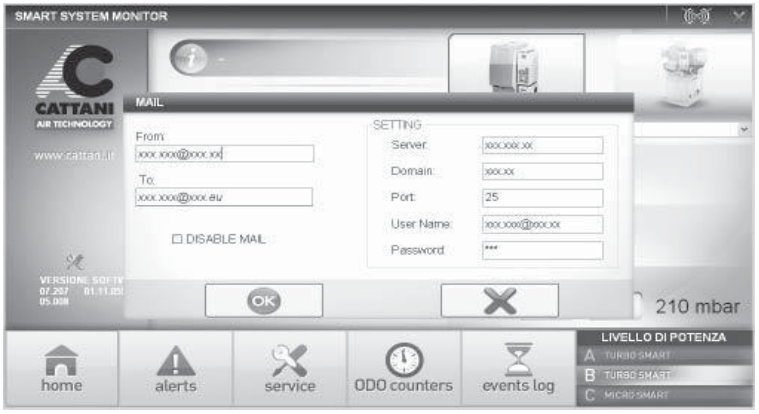
In this menu you can change the language, set the desired level of pressure and switch the machine from aspirator for 2 dental units to aspirator for 4 dental units, thanks to an activation code.

To enter the SYSTEM DATA SETTINGS menu, enter the password 456000 and press OK.

In this technical menu you can view and modify all the parameters of the Turbo Smart.

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

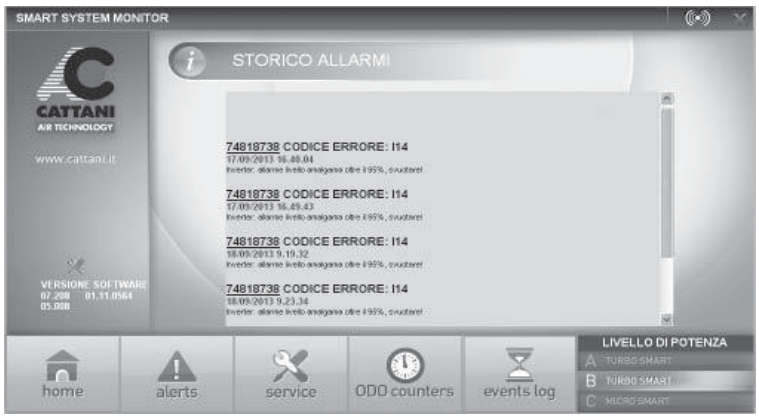
From the main menu, click on the email icon to enter data such as the address of the doctor or technician to which alarm communications must be sent.



In case of malfunction, an alarm will be shown on the display and an email sent to the technician in charge.

Any alarms generated during the day are displayed with an error code and a description in the ALERTS box.

The full history of all the alarms occurred in the machine during the entire period of operation can be viewed in the EVENT LOG folder.



The operation cycles of the Turbo Smart are saved in the ODO COUNTERS menu.

• *Alarms description*

Alarm code AC80	Alarm code AC80-07	DESCRIPTION	SOLUTION
00	0	Microcontroller memory alarm	Contact the technician
I14	2	Amalgam level > 95%	Replace the amalgam container as soon as possible
I15	3	Amalgam level > 100%	Replace the amalgam container
I00	32	Microcontroller memory alarm	Contact the technician
I01	33	Short-circuit due to one of the two motors	Identify where the short-circuit is coming from and eliminate it
I02	34	Short-circuit before the motors' starting	Contact the technician (the PC-Board is likely to be damaged)
I03	35	Condensers have not been charged	Contact the technician (replace the PC-Board)
I04	36	Overtemperature (temperature has exceeded the max. allowed limit)	Ventilate the plant room
I05	37	Blower overcurrent (the blower has exceeded the current limit)	Check the operation of the blower (seized or excessive friction)
I07	39	Condensers overvoltage (the condensers have exceeded the max. voltage limit)	Check the mains voltage (max. 260V)
S08	40	Centrifuge short-circuit	Eliminate the short-circuit
S09	41	PC-Board short-circuit on the centrifuge output	Replace the PC-Board
S10	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)
S11	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)
I16	48	The vacuum detecting pipe is disconnected	Connect the vacuum detecting pipe to the centrifuge
I17	49	Centrifuge thermal switch switched-on	Ventilate the 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 on the web site **www.cattani.it**. We recommend they are consulted especially for updates about **safety**.

• Turbo-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, cleanse and disinfect with Puli-Jet plus new (refer to the paragraphs "Signals and warnings" and "Routine maintenance").

• Close with polyethylene plugs all machine inlets and outlets.

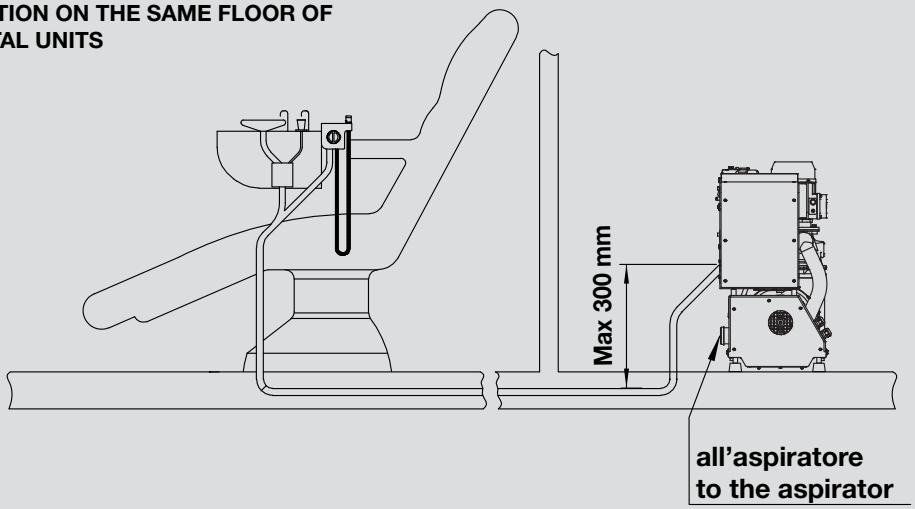
• Place the machine into a polyethylene bag, seal and pack it in 3-layer corrugated board.

• SCHEMA DI MONTAGGIO TURBO-SMART
• INSTALLATION LAYOUT

MONTAGGIO AL PIANO

INSTALLATION ON THE SAME FLOOR OF THE DENTAL UNITS

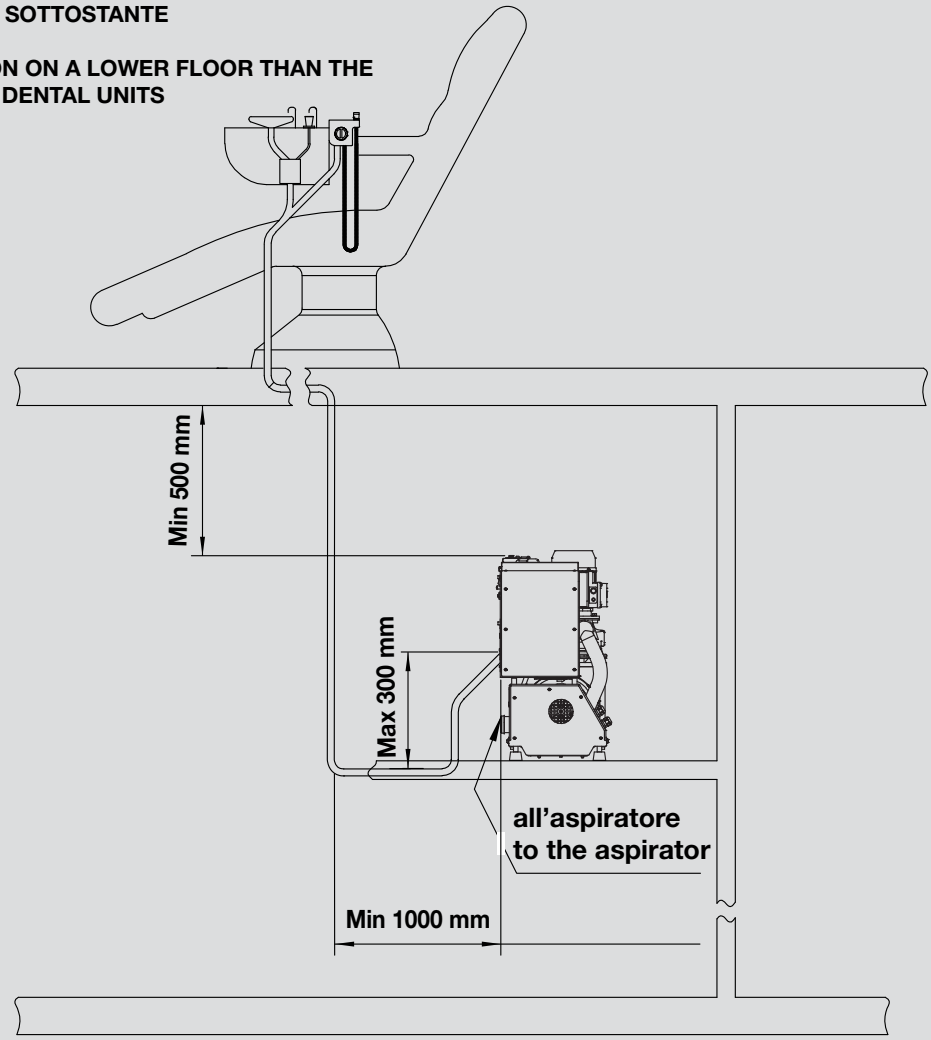
Fig. A
Draw. A



MONTAGGIO SOTTOSTANTE

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

Fig. B
Draw.B



• COLLEGAMENTI CIRCUITO INVERTER AC80-07
• INVERTER AC80-07 CONNECTIONS

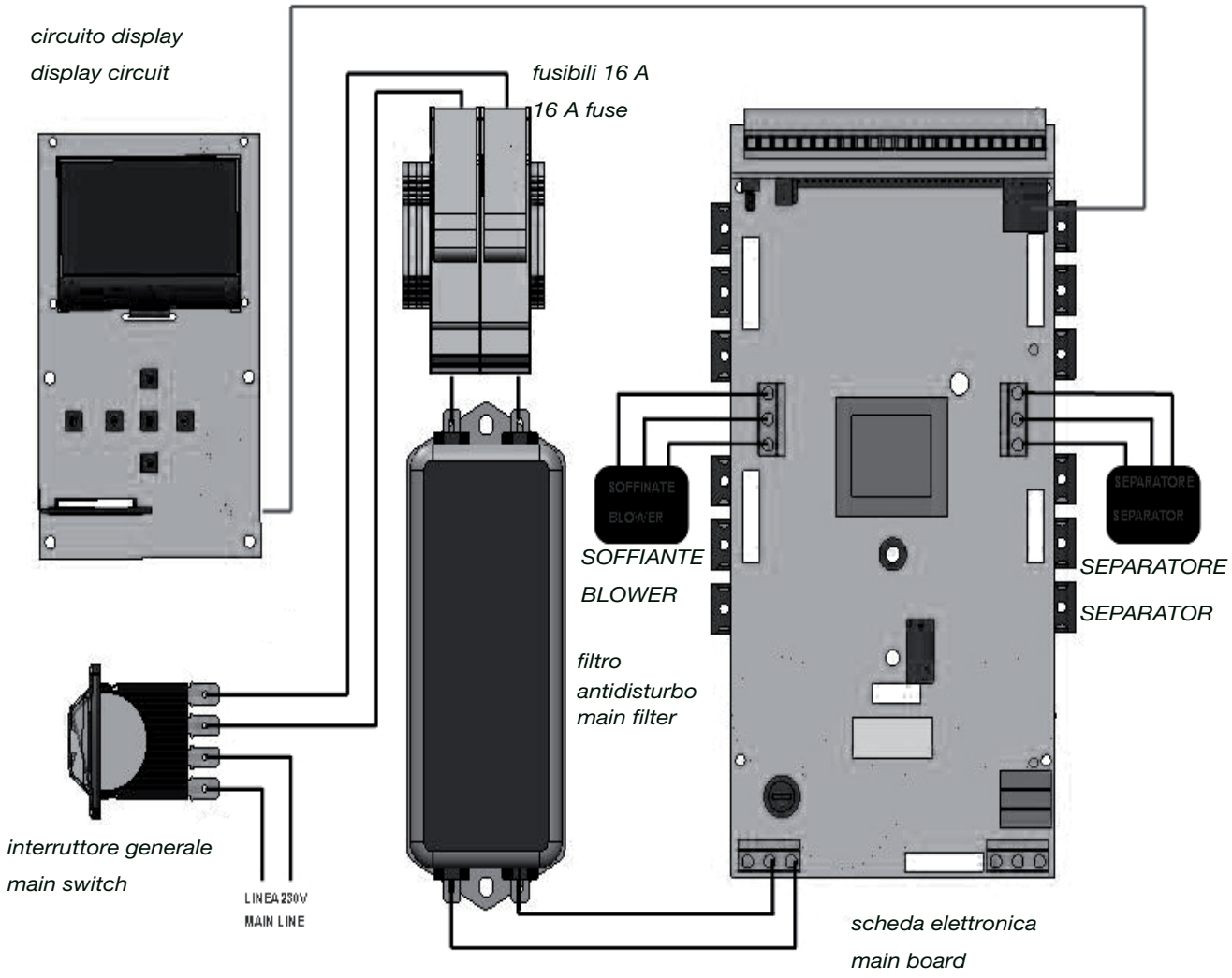


Fig. C

Draw. C

• PROVE DI DIAGNOSI SUI TURBO-SMART
• DIAGNOSTIC TESTS ON TURBO-SMART

Per verificare il corretto funzionamento del Turbo-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. L'altro test dovrà essere eseguito con l'ingresso d'aspirazione chiuso.

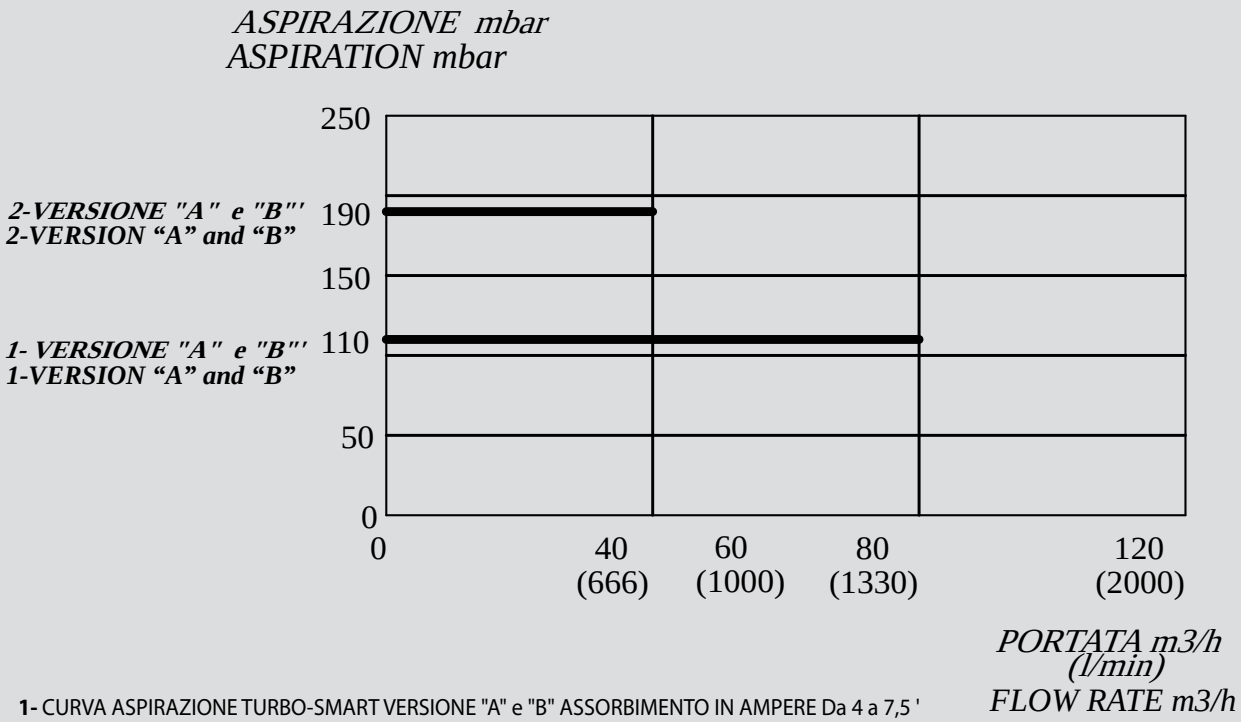
Here below you can find the description of some dynamic tests useful to check the correct working of Turbo-Smart.
One test must be carried out on running machines with open aspiration inlet not connected to the piping, the other one with closed aspiration inlet.

Modello Turbo-Smart Turbo-Smart model	Frequenza raggiunta Reached frequency [Hz]	Prevalenza raggiunta Reached head [mbar]	I totale Total I [A]	I separatore centrifugo Centrifugal separator I [A]	Condizione Aspiration inlet
Versione A Version A	85	40 ÷ 50	3 ÷ 4,5	0,2 ÷ 0,5	Ingresso aspirazione aperto in aria Open
Versione B Version B	110	60 ÷ 70	6 ÷ 7,5	0,2 ÷ 0,5	Ingresso aspirazione aperto in aria Open
Versione A/B Version A/B	60 ÷ 70	195 ÷ 200	4 ÷ 5	0,2 ÷ 0,5	Ingresso aspirazione chiuso Closed

Fig. D

Draw. D

• DIAGRAMMA DI LAVORO DI TURBO-SMART
• TURBO SMART WORKING DIAGRAM



1- CURVA ASPIRAZIONE TURBO-SMART VERSIONE "A" e "B" ASSORBIMENTO IN AMPERE Da 4 a 7,5 '
FREQUENZA (Hz) Da 85 a 110. PORTATA MAX PER POSTO LAVORO 20 m3/h
PREVALENZA CONSIGLIATA PER INTERCETTATORE DI SPRUZZI.

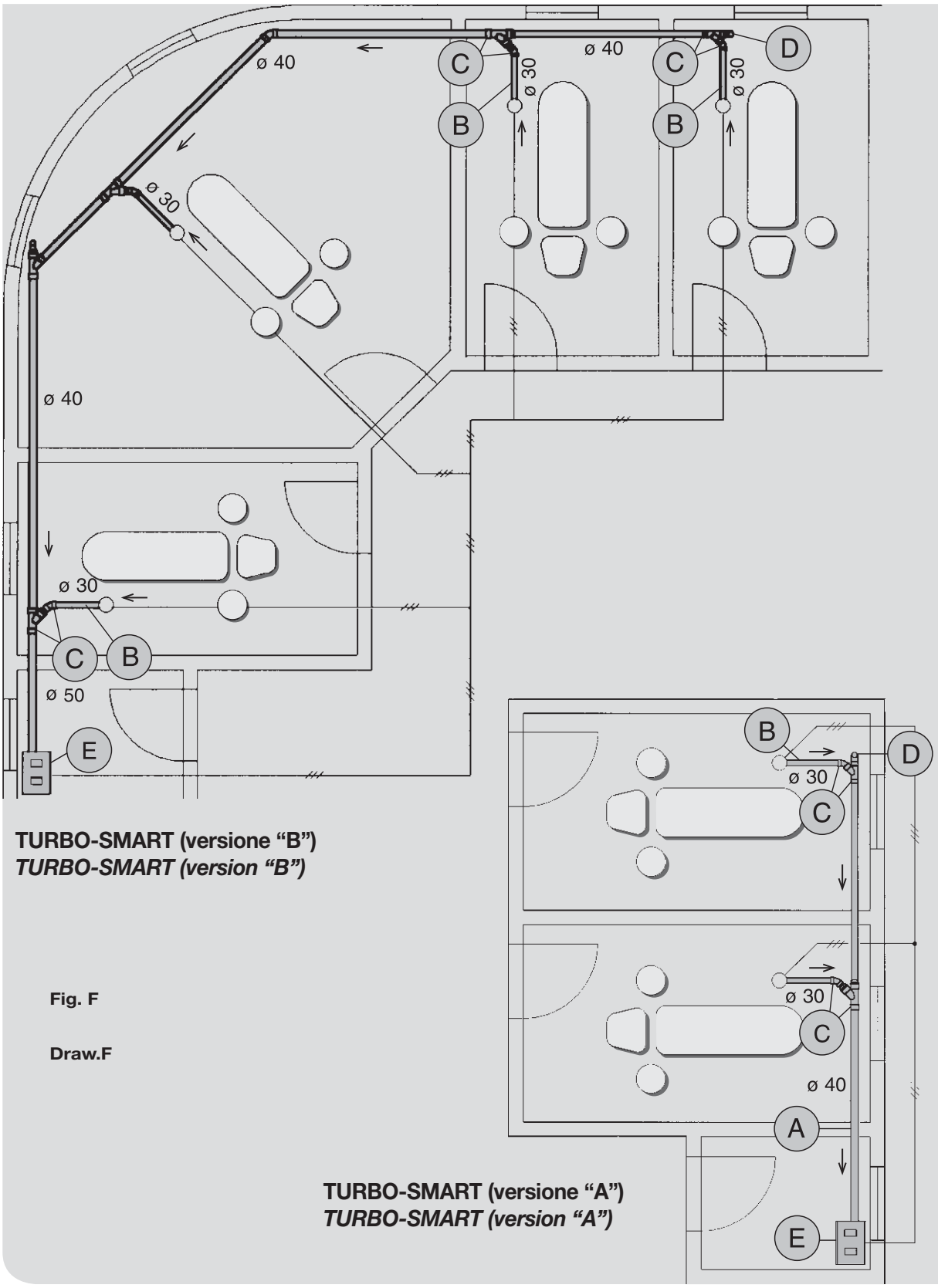
1 - TURBO-SMART ASPIRATION CURVE VERSION "A" AND "B" ABSORPTION IN AMPERE from 4 to 7.5'.
CYCLE (Hz) From 85 to 110. MAX. FLOW RATE FOR EACH WORKING PLACE 20 m3/h
MAX.HEAD SUGGESTED FOR SPRAY INTERCEPTOR.

2- CURVA ASPIRAZIONE TURBO-SMART VERSIONE "A" e "B" ASSORBIMENTO IN AMPERE Da 5.5 a 7,5 '
FREQUENZA (Hz) Da 80 a 100. PORTATA MAX PER POSTO LAVORO 10 m3/h
PREVALENZA CONSIGLIATA PER ASPIRAZIONE CHIRURGICA.

2 - TURBO-SMART ASPIRATION CURVE VERSION "A" AND "B" ABSORPTION IN AMPERE from 5.5 to 7.5'.
CYCLE (Hz) From 80 to 100. MAX. FLOW RATE FOR EACH WORKING PLACE 10 m3/h
MAX.HEAD SUGGESTED FOR SURGICAL ASPIRATION

Fig. E

Draw.E



TURBO-SMART (versione “B”)
TURBO-SMART (version “B”)

Fig. F

Draw.F

TURBO-SMART (versione “A”)
TURBO-SMART (version “A”)

• *ESPLOSO TURBO SMART*
• *SPLIT-UP DRAWING*

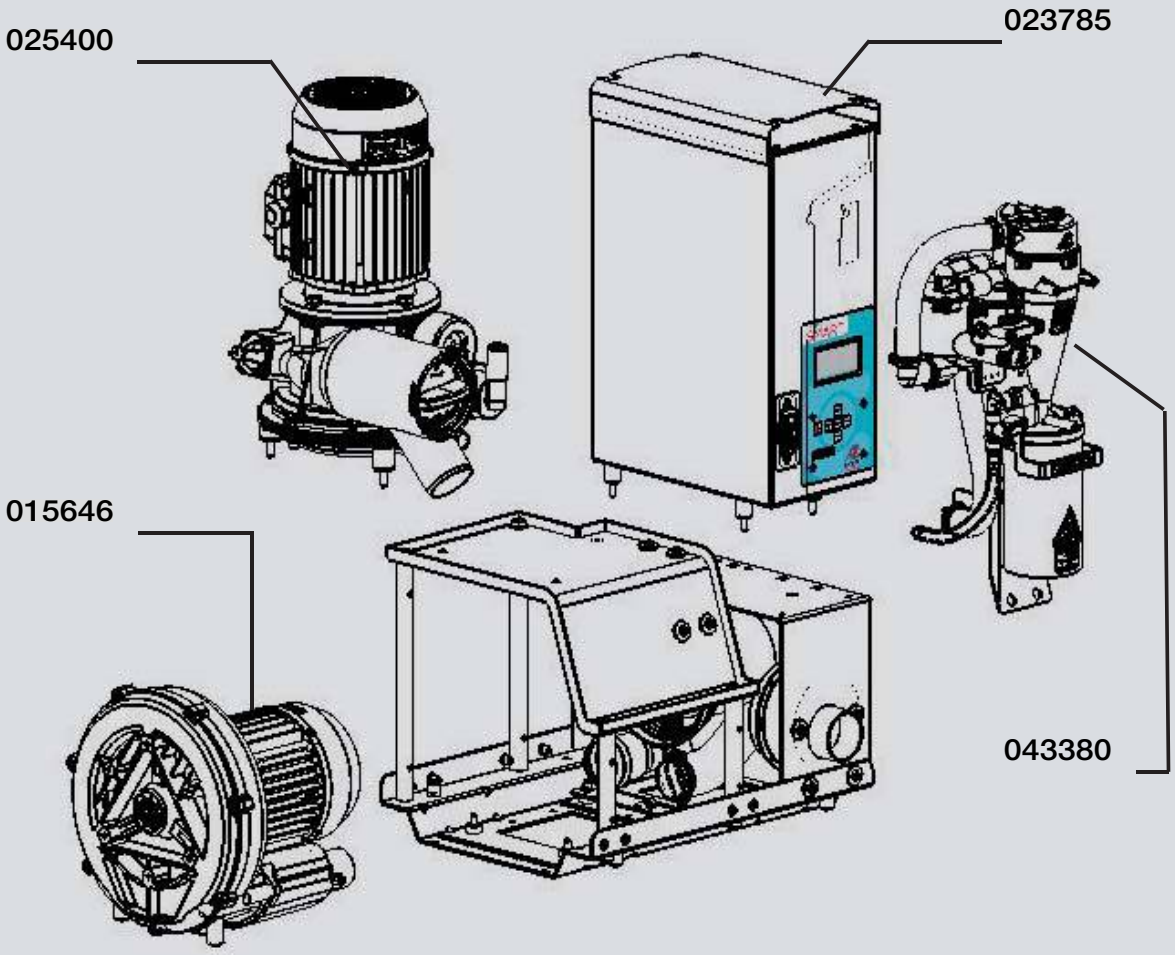


Fig. G

Draw. G

Cod. 023785	CENTRALINO ELETTRICO ELECTRIC CONTROL PANEL
Cod. 025400	SEPARATORE CENTRIFUGO CENTRIFUGAL SEPARATOR
Cod. 015646	SOFFIANTE BLOWER
Cod. 043380	IDROCICLONE HYDROCYCLONE

• DIMENSIONI TURBO SMART
• TURBO SMART DIMENSION

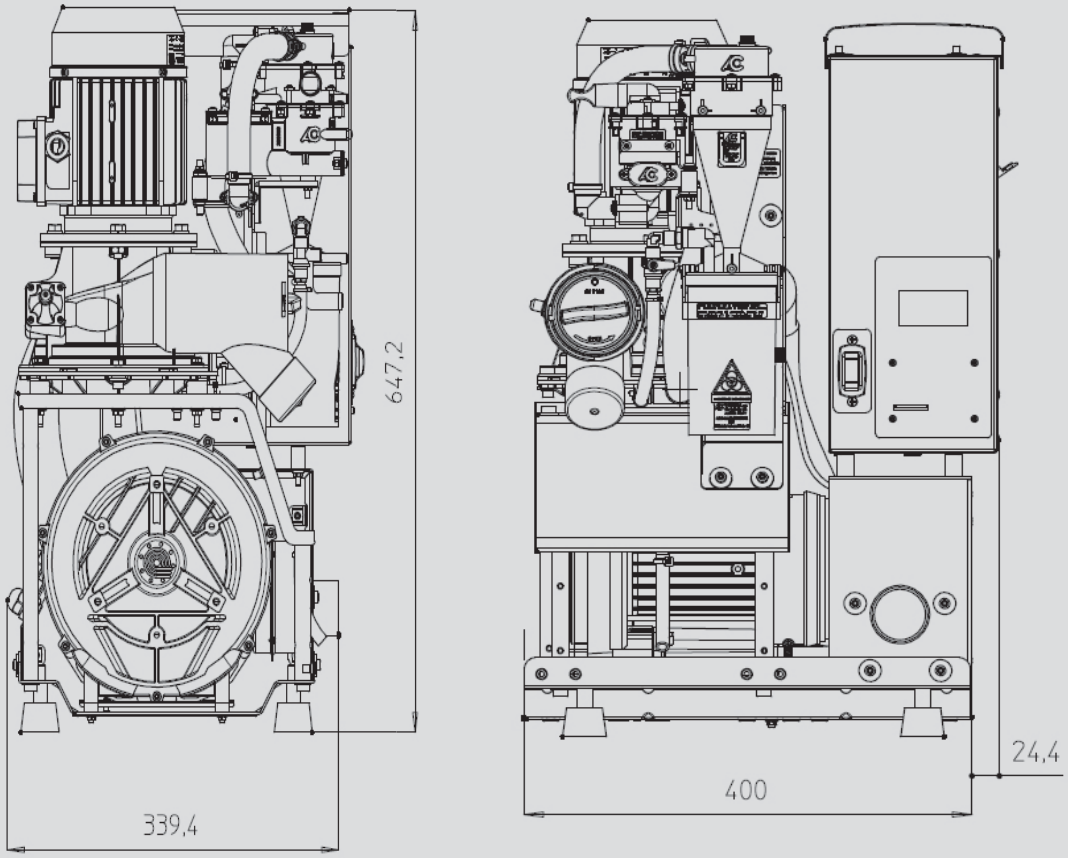


Fig. H

Draw.H

ITALIAN PATENTS OR PATENT APPLICATIONS:

CATTANI: 1201707 - 1234828 - 1259318 - 1.187.187 - 1253460 - 233634 - 2337706 -1294904

ESAM: 1225173 - 1253783 - 0791751

FOREIGN PATENTS OR PATENT APPLICATIONS:

CATTANI: AU 546.143 - US 4,386,910 - US 4,787,846 - US 5,039,405 - US 5,002,486 AU 580839 - US 4,684,345 - US 5,330,641 - AT 0040181 - CH 0040181 - DE 0040181 FR 0040181 - GB 0040181 - LU 0040181 - SE 0040181 - CH 0211808 - DE 0211808 FR 0211808 - GB 0211808 - SE 0211808 - DE 0335061 - ES 0335061 - FR 0335061 GB 0335061 - AT 0557251 - DE 0557251 - ES 0557251 - FR 0557251 - GB 0557251 DE 0638295 - DK 0638295 - ES 0638295 - FR 0638295 - GB 0638295 - NL 0638295 SE 0638295 - US 6,083,306 - US 6,090,286 - US 6,022,216

ESAM: US 4,948,334 - DE 0351372 - ES 0351372 - FR 0351372 - GB 0351372 EP 0791751 - US 5,779,443 - CH 0791751 - DE 0791751 - ES 0791751 - FR 0791751 GB 0791751 - PT 0791751 - AU 93321 - ES 107358 - FR 222.394/395

PENDING PATENT

CATTANI: IT M098A000019 - IT M098A000119 - EP 99830010.7 - EP 99830011.5 EP 99830250.9 - EP 00830491.7 - IT M099A000165 - US 09/624,182

CATTANI
AIR TECHNOLOGY
6/A Via Natta. 43122 Parma, Italy
10’21’48” EST - 44’50’46” NORD

Ph. +39.0521.607604

Fax +39.0521.607628 (Sales Dept.)
Fax +39.0521.607855 (Purchasing Dept.)
Fax +39.0521.399966 (Accounting Dept.)

www.cattani.it - e-mail: info@cattani.it

Company with Quality System Certified according to
UNI EN ISO 9001:2008 - UNI EN ISO 13485:2012

ИМ05

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