



TURBO SMART - TURBO SMART TS
TURBO SMART 2V
TURBO SMART CUBE
MICRO SMART
MICRO SMART CUBE



Instruction Manual

GB



The original version of the instruction manual is in Italian.

Manuals written in other languages are translations of the original manual.

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GENERAL OPERATION DATA 50/60 HZ MICRO SMART AND MICRO SMART CUBE DENTAL ASPIRATORS

Model	Micro Smart	Micro Smart Cube
Rated voltage	230 V ~	230 V ~
Rated frequency	50/60 Hz	50/60 Hz
Absorbed current	6,3 A	5,8 A
Type of protection against direct and indirect contacts	Class I	Class I
Use instructions	Continuous operation	Continuous operation
Protection against humidity	Common	Common
Absorbed power	1,12 kW	0,95 kW
Maximum flow	900 l/min	1000 l/min
Maximum head for continuous duty	210 mbar	210 mbar
Rotation speed	60 Hz 120 Hz	60 Hz 145 Hz
Sound pressure without box	64 dB(A) 71 dB(A)	
Sound pressure with plastic box	63 dB(A) 68,5 dB(A)	
Sound pressure with box for indoors	41 dB(A) 48 dB(A)	59 dB(A)
Sound pressure with box for outdoors	54,5 dB(A) 61,2 dB(A)	
~	Alternating current	IEC 417-5032
⊕	Earthing	IEC 417-5019
	Protection type against direct and indirect contacts	CEI EN 60601-1
○	Open (disconnection from power supply mains)	IEC 417-5008
I	Closed (connection to power supply mains)	IEC 417-5007

Manufactured by **CATTANI S.p.A. - PARMA - ITALIA**



Sound pressure level detected according to ISO 3746-1979 (E).

Parameters: r= 1.5 - background noise: 34 dB(A) - Bruel & Kjaer type 2232 instrument.

GENERAL OPERATION DATA 50/60 HZ 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
Absorbed current	6,5 A	9 A
Type of protection against direct and indirect contacts	Class I	Class I
Use instructions	Continuous operation	Continuous operation
Protection against humidity	Common	Common
Absorbed power	1,5 kW	2 kW
Maximum flow	1400 l/min	1700 l/min
Maximum head for continuous duty	210 mbar	210 mbar
Rotation speed	70 Hz 85 Hz	70 Hz 110 Hz
Sound pressure without box	68,4 dB(A) 69 dB(A)	68,4 dB(A) 73,7 dB(A)
Sound pressure with plastic box	66,4 dB(A) 67 dB(A)	66,4 dB(A) 72 dB(A)
Sound pressure with box for indoors	48,5 dB(A) 49,5 dB(A)	48,5 dB(A) 52,2 dB(A)
Sound pressure with box for outdoors	54 dB(A) 55 dB(A)	54 dB(A) 58,7 dB(A)
~	Alternating current	IEC 417-5032
⊕	Earthing	IEC 417-5019
	Protection type against direct and indirect contacts	CEI EN 60601-1
○	Open (disconnection from power supply mains)	IEC 417-5008
I	Closed (connection to power supply mains)	IEC 417-5007

Manufactured by **CATTANI S.p.A. - PARMA - ITALIA**



Sound pressure level detected according to ISO 3746-1979 (E).

Parameters: r= 1.5 - background noise: 34 dB(A) - Bruel & Kjaer type 2232 instrument.

GENERAL OPERATION DATA 50/60 HZ TURBO SMART TS DENTAL ASPIRATOR

Model	Turbo Smart TS "A"	Turbo Smart TS "B"
Rated voltage	230 V ~	230 V ~
Rated frequency	50/60 Hz	50/60 Hz
Absorbed current	6,5 A	9 A
Type of protection against direct and indirect contacts	Class I	Class I
Use instructions	Continuous operation	Continuous operation
Protection against humidity	Common	Common
Absorbed power	1,5 kW	2 kW
Maximum flow	1600 l/min	2000 l/min
Maximum head for continuous duty	210 mbar	210 mbar
Flow at 150 mbar	860 l/min	1200 l/min
Rotation speed	80 Hz	100 Hz
Sound pressure without box	67,5 dB(A)	67,5 dB(A)
~	Alternating current	IEC 417-5032
⊕	Earthing	IEC 417-5019
	Protection type against direct and indirect contacts	CEI EN 60601-1
○	Open (disconnection from power supply mains)	IEC 417-5008
I	Closed (connection to power supply mains)	IEC 417-5007

Manufactured by CATTANI S.p.A. - PARMA - ITALIA



Sound pressure level detected according to ISO 3746-1979 (E).

Parameters: r= 1.5 - background noise: 34 dB(A) - Bruel & Kjaer type 2232 instrument.

GENERAL OPERATION DATA 50/60 HZ TURBO SMART CUBE DENTAL ASPIRATOR

Model	Turbo Smart Cube "A"	Turbo Smart Cube "B"
Rated voltage	230 V ~	230 V ~
Rated frequency	50/60 Hz	50/60 Hz
Absorbed current	6,8 A	8,7 A
Type of protection against direct and indirect contacts	Class I	Class I
Use instructions	Continuous operation	Continuous operation
Protection against humidity	Common	Common
Absorbed power	1,5 kW	1,95 kW
Maximum flow	1400 l/min	1700 l/min
Maximum head for continuous duty	210 mbar	210 mbar
Rotation speed	70 Hz 140 Hz	70 Hz 165 Hz
Sound pressure with box for indoors	60 dB(A)	60 dB(A)
~	Alternating current	IEC 417-5032
⊕	Earthing	IEC 417-5019
	Protection type against direct and indirect contacts	CEI EN 60601-1
○	Open (disconnection from power supply mains)	IEC 417-5008
I	Closed (connection to power supply mains)	IEC 417-5007

Manufactured by CATTANI S.p.A. - PARMA - ITALIA



GENERAL OPERATION DATA 50/60 HZ TURBO SMART 2V DENTAL ASPIRATOR

Model	Turbo Smart 2V
Rated voltage	230 V ~
Rated frequency	50/60 Hz
Absorbed current	9,8 A
Type of protection against direct and indirect contacts	Class I
Use instructions	Continuous operation
Protection against humidity	Common
Absorbed power	2,2 kW
Maximum flow	1600 l/min
Maximum head for continuous duty	250 mbar
Rotation speed	70 Hz 110 Hz
Sound pressure without box	70 dB(A)

~	Alternating current	IEC 417-5032
⊕	Earthing	IEC 417-5019
	Protection type against direct and indirect contacts	CEI EN 60601-1
○	Open (disconnection from power supply mains)	IEC 417-5008
I	Closed (connection to power supply mains)	IEC 417-5007

Manufactured by **CATTANI S.p.A. - PARMA - ITALIA**



CERTIFICATION OF MEDICAL DEVICES COMPLIANT WITH REGULATION (EU) 2017/745 CLASS I

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Following the EC Declaration of Conformity for our devices classified as medical devices Class I: **Micro Smart, Micro Smart Cube, Turbo Smart, Turbo Smart TS, Turbo Smart Cube, Turbo Smart 2V** Technicians authorised to carry out repair work on the above-mentioned machines must use exclusively original CATTANI spare parts.

Replacement of parts that have lost their mechanical/electrical characteristics over time, is considered corrective maintenance of failures, aimed at restoring the equipment to its initial safe state. Therefore, after the intervention has been carried out, Regulation (EU) 2017/745 requires a retest of the equipment.

The tests to be performed are described in the CEI EN 62353 standard "Medical Electrical Equipment"
- Periodic inspections and tests to be carried out after repair work on medical electrical equipment
- and it is also advisable to perform them in accordance with the methods indicated in CEI EN 60601-1 (CEI 62-5).

Furthermore, with regard to the components listed below, which are subject to traceability, technicians should follow the table below:

Components	Code	
CONTROL PANEL	023758	Inverter control panel for Micro Smart
CONTROL PANEL	023736	Inverter control panel for Micro Smart Cube
CONTROL PANEL	023732	Inverter control panel for Turbo Smart
CONTROL PANEL	023744	Inverter control panel for Turbo Smart TS
CONTROL PANEL	023739	Inverter control panel for Turbo Smart Cube
CONTROL PANEL	023737	Inverter control panel for Turbo Smart 2V

and report to **CATTANI S.p.A.** sales office, along with the request for said components, the **SERIES NUMBER** of the target machine, undertaking to

install them on the machine under repair and not on other ones.

INTRODUCTION

SIGNALS AND WARNINGS

INTRODUCTION

This presentation illustrates the procedures for installation and starting of Smart aspirators and provides information on the hazards and the precautions to prevent them. Make sure that this manual is ready for reference during installation, starting, operation and maintenance of your Smart aspirator.

Updated manuals are available on our website www.cattani.it. We recommend you refer to these especially for the latest **safety** updates.

This system is designed for professional use and therefore should be used only by qualified and suitably trained personnel.

SIGNALS AND WARNINGS



Please read through the manual before installation



Electric shock hazard: even 230V ~ can cause death.



Biological hazard: infections from epidemic diseases



General hazard sign



Personal protection for heavy duty work



Personal protection for biological hazard



High temperature



No flammable, corrosive or explosive substances in the room



Compulsory direction of flow or rotation

It is not always possible to express all the hazards and relevant instructions with a sign; users are therefore required to read the warnings and comply with them.

Failing to observe a danger sign or warning can harm operators or patients.

Do not remove safety protections, do not alter the

machines or their operation.

Despite our best efforts, danger warnings may not be exhaustive; if you find that this is the case, please arrange for any danger sources that we may have overlooked to be indicated and kindly notify us.

IMPORTANT NOTICE ON CENTRAL ASPIRATOR CERTIFIED AS MEDICAL DEVICE

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A centralized aspirator does not provide a direct air flow to the dental unit, but to the distribution net that must ensure the correct distribution to the various devices.

According to the certification of aspirators as

medical devices, without a proper distribution the airflow cannot be guaranteed, thus failing the very aim of the certification of the central aspirator as a Medical Device.

INSTALLATION AND STARTING

RECOMMENDED PRECAUTIONS

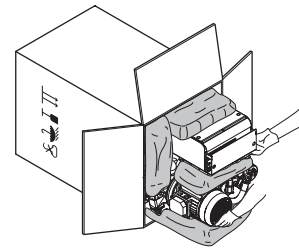
Before unpacking the appliance, check the outside of the package and the warning shockwatch. If it is red or if the carton is damaged, accept the material reserving the right to examine the appliance.

Unpack the appliance following the instructions shown on the package. The carton is recyclable. Dispose of it in compliance with current regulations. Keep the plugs that close all inlets and outlets, so that you may use them when moving the aspirator. Machine installation must be performed by a skilled person equipped with the necessary tools. Install the appliance in a clean location, away from heat sources, humidity and dust. For outdoor installation: on a balcony, in veranda or gardens, protect the machines from rain, splashing, humidity, frost and direct sunshine.

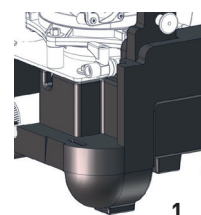
For outdoor installation of Turbo Smart and Micro Smart we can supply a box featuring: double insulating roof, antifreeze and ventilation systems (both fitted with fixed thermostat for automatic temperature control).

In the plant room, temperature can range from a minimum of + 5 °C to a maximum of +35 °C. Turbo and Micro Smart Cube are designed with a foam enclosure for indoor use only and cannot be installed outdoors.

All machines with box, for indoor and outdoor installation, can be supplied with antifreeze system. If the plant room needs to be ventilated or air-conditioned, we suggest you have a project designed by a thermo-technician. Access to the plant room must be closed to patients and unauthorized people. If such a room is not available, machines should be protected by a suitable cover, which must not be easy to remove.



Use protections and danger signs, in order to prevent accidental contacts and the risk of electric shocks or the event (unlikely but possible) of fire, explosion and contaminating air or liquid leakage. Use only indoor and outdoor boxes designed and produced by the manufacturer of the system. Keep the plant room free from flammable material and ensure that there is no possibility of gas leakages. Caution: to prevent the risk of electric shock, this appliance must be connected to power mains with protective earthing. Do not connect damaged appliances to the mains; do not use extension cables, multiple sockets or plugs. Before connecting the machine to the mains, ensure that the line complies with regulations C.E.I. 64-8 and that a thermal switch with residual current operated circuit breaker (class A or B) (16A) to EN 61008-1 standards is present. Light coloured, wooden, linoleum, rubber or marble floors, in contact with rubber vibration dampers or with the supports of the box in the Cube version **(1)** can change colour or get marked; therefore, you should place a plastic sheet or other suitable material under the unit to isolate the vibration dampers from the floor.



INSTALLATION

Before connecting the aspirator to the piping of the centralized system, make sure that the suction tubes are clean as heavy debris could damage the appliance. Connect the suction tube (PVC **(2b)** grey colour, supplied with the appliance) to the 50 mm Ø tube-holder "aspirated fluid inlet" **(2)***. Connect the other end of the same tube to the suction piping **(3)** coming from the surgeries (page 15).

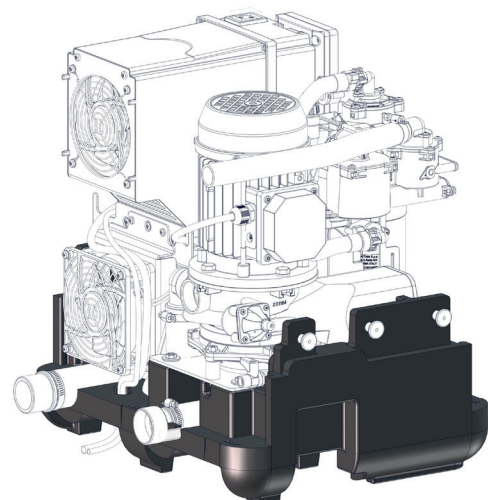
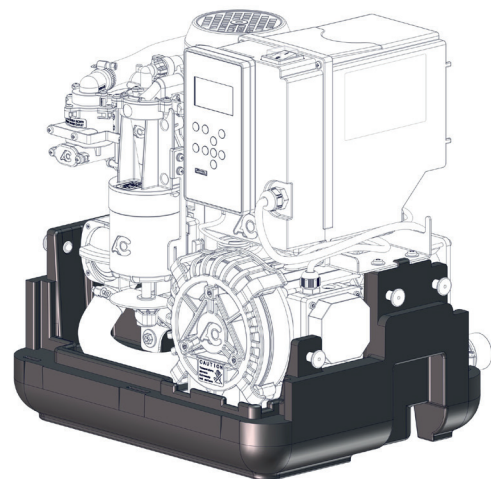
The black heat-resistant exhaust air tube **(4b)**, fitted with a metal spiral, must be connected to the 50 mm Ø tube-holder **(4)**** ("exhaust air outlet").

The other end of the tube will be connected to the antibacterial filter **(5)** passing preferably through a silencer **(5a)**, also 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 tube.

If fitted with the Hydrocyclone, the aspirator must drain waste liquids by gravity. The liquid drain tube must never be raised higher than the waste outlet. The tubes connecting the machine to the suction and draining system are flexible to dampen the small vibrations produced by the operation of the aspirator.

The suction piping should be run in the floor and when close to the aspirator it should rise about 30 cm to reach the tube-holder **(2)** (fig. A and B, page 40).

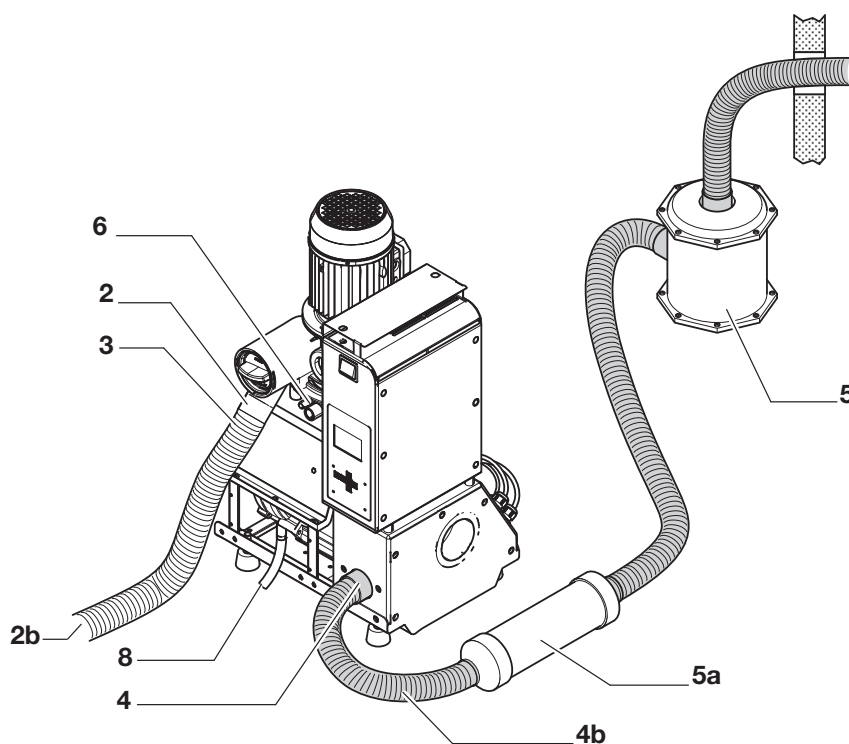
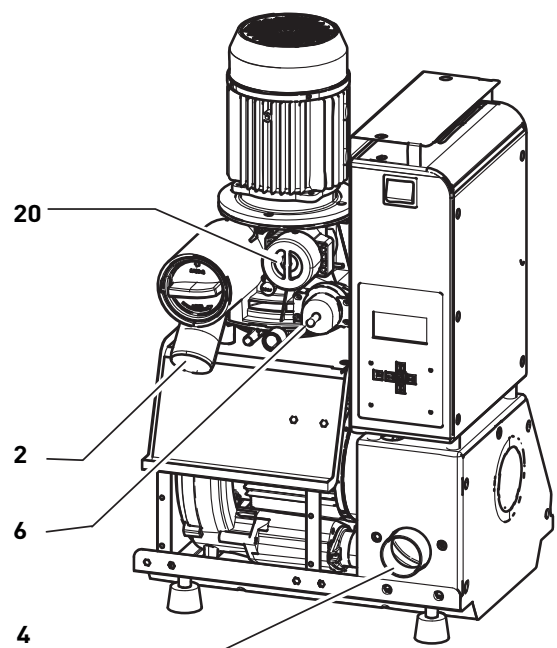
(*) 50 mm diameter for Turbo Smart, Turbo Smart TS, Turbo Smart Cube and Turbo Smart 2V, 30 mm diameter for Micro-Smart and 40 mm diameter for Micro Smart Cube. (**) 50 mm diameter for Turbo Smart, Turbo Smart TS, Turbo Smart Cube and Turbo Smart 2V, 30 mm diameter for Micro Smart and 40 mm diameter for Micro Smart Cube.



Even when the Smart aspirators are installed on a lower level than the dental units, the suction piping must go down from the surgeries to the level of the aspirator, with a few metres of piping laid horizontally on the same level as the machine and then move up with a flexible tube to the centrifugal separator (fig. B, page 40). The aspirated fluid will be reaspirated by the aspirator.

Once the installation has been completed, the power cable must be connected to the power mains in accordance with current regulations.

Finally, connect the low voltage users line to the clean contacts of the dental units (see wiring diagrams page 41-42-43-44). Make sure that the contact is clean (no voltage should be present).

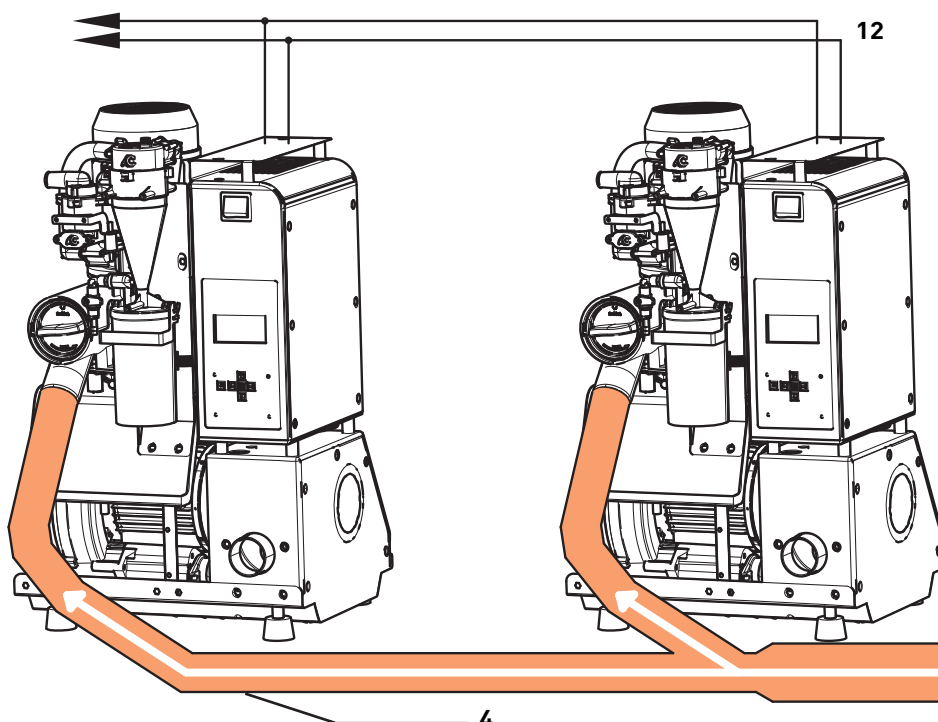


PARALLEL INSTALLATION

For parallel installations, we recommend including only machines of the same type, with the same flow and head values. The installation of two or three aspirators in parallel* will double or triple the total flow, provided that the diameter of the main piping is increased by 10 mm for each additional aspirator unit. Similarly, the diameter of the exhaust air tube must be increased. Turbo Smart, Turbo Smart TS, Turbo Smart Cube and Turbo Smart 2V are always supplied complete with all the accessories needed for installation in parallel, therefore no one-way valves, supplementary control panels or peripheral units are required. After connecting two or three aspirators in parallel to the same main piping, connect in parallel the users wires **(12)** coming from the different dental units. With parallel installation, take care not to invert the small cables

of terminals no. 1 with the small cables of terminals no. 2. With multiple aspirators in parallel, there may be instances when one unit stops and none of the operators notice it. To prevent this problem, the terminals of the control panel enable remote alarm signals (refer to wiring diagrams on pages 41-42-43-44). Turbo Smart, Turbo Smart TS, Turbo Smart Cube and Turbo Smart 2V units in parallel can offer better performance and energy savings when they are working simultaneously, regardless of the suction demand. Disconnecting one of the aspirators will not result in energy saving and will affect the performance of the other aspirators.

(*) The installation in parallel of both Micro Smart and Micro Smart Cube is possible only if they are fitted with the non-return valve.



STARTING, FINAL TEST AND STAFF INSTRUCTION

Once the aspirator has been installed and connected, simply press the on/off switch and suction will start when one of the dental units has started working. To check if the Smart aspirator is working correctly, it is advisable to carry out the dynamic tests (shown in fig. G-H, page 45-46). Instruction on the use and ordinary maintenance of the aspirator should be provided to staff when the appliance is new and not yet contaminated.

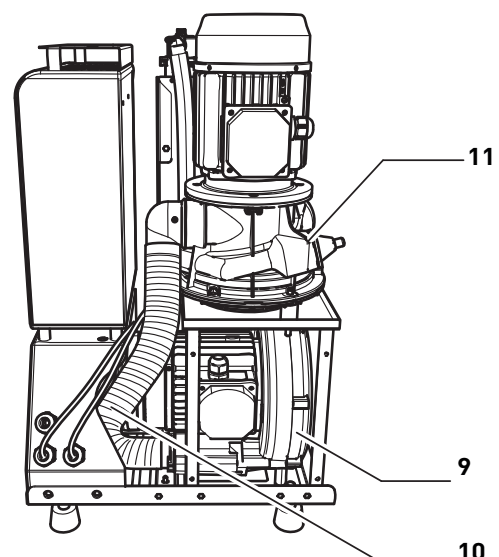
Surgery staff must be instructed to read the display where the operation phases of the Smart systems are shown, to interpret the danger warnings displayed and to carry out correct maintenance operations using Puli-Jet plus 2.0 with anti-scale agent **(A)**, Pulse Cleaner **(B)** and disinfectant, antifoam tablets **(C)**.

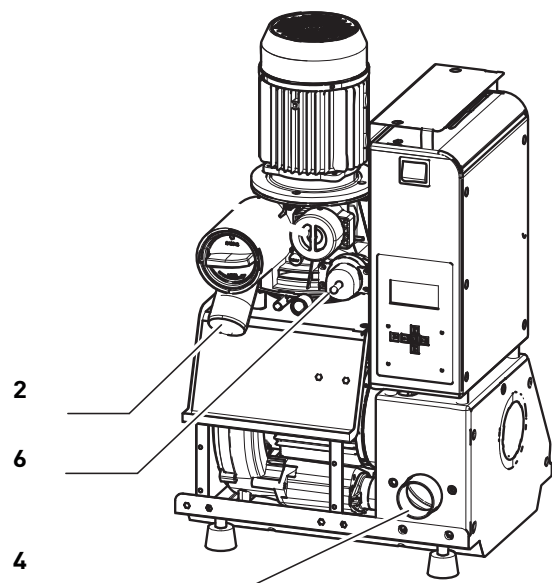


OPERATION

The suction motor **(9)** (through tube **10**) creates a vacuum inside the centrifugal separator **(11)**. The fluid coming from the surgeries, enters the centrifugal separator **(11)** through the manifold **(2)**. The centrifugal separator separates air from liquids: air is exhausted outside through tube **(4)** while liquids (in the version without amalgam separator) are drained to the sewage through the waste tube connected to the tube-holder **(6)**.

The centrifugal separator **(11)** starts before the blower **(9)**, giving the system time to drain any liquids that might collect inside the centrifugal separator before aspiration starts. Moreover, when the machine is switched off, a timer will keep the aspirator running for a minimum of 10 seconds which can be adjusted up to 300 seconds.





ISO AMALGAM SEPARATOR

Smart aspirators can be supplied with "Hydrocyclone ISO 18" amalgam separator for Turbo Smart, Turbo Smart TS, Turbo Smart Cube and Turbo Smart 2V and with "Hydrocyclone ISO 6" for Micro Smart and Micro Smart Cube. The amalgam separator comes with a separate instruction and maintenance manual.

ROUTINE MAINTENANCE

ROUTINE MAINTENANCE

Routine maintenance must be carried out by suitably instructed surgery staff.

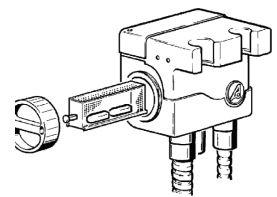
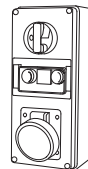
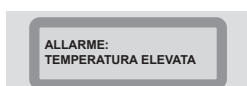
- We recommend you pay special attention to all the danger signs and wear goggles, gloves and disposable overalls for protection.



EVERY DAY

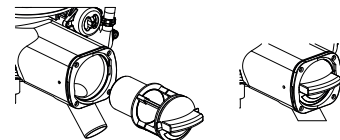
- Check the display for alarms and in case of danger warning, contact the technician.
- At the end of the day, aspirate a solution of Puli-Jet plus 2.0 disinfectant with anti-scale agent **(A)** using the Pulse Cleaner **(B)**;
- **Before working on the aspirator, disconnect power.**

- Place the antifoam disinfectant tablets in the filters of the dental units **(C)**.



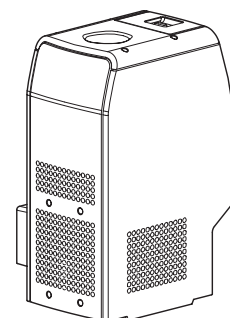
PERIODICALLY

- 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, in particular flammable material; ensure that there is no possibility of formation of corrosive, flammable or explosive mixtures.



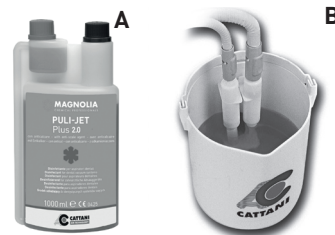
EXTRAORDINARY MAINTENANCE

EXTRAORDINARY MAINTENANCE

Extraordinary maintenance procedures must be carried out by a qualified technician using original spare parts:

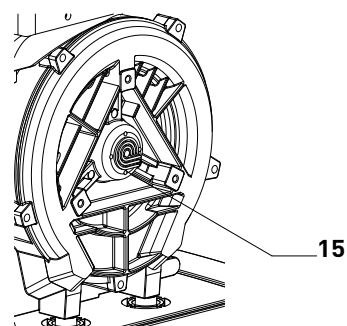
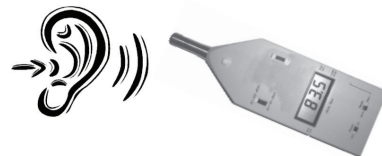
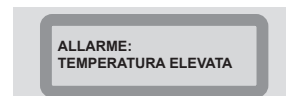
- We recommend you pay special attention to all the danger signs and wear goggles, gloves and disposable overalls for protection.
- Check that routine maintenance has been duly carried out and make sure that Magnolia products are used.
- Before working on the appliances, carry out a few washes with Puli-Jet plus 2.0 **(A)** and wait 15 minutes to give the disinfectant time to be effective. Disinfect the outside of the machine too.

If the machine cannot aspirate, pour the disinfectant in manually and move the machine at different angles to allow the liquid to reach all the infected parts.



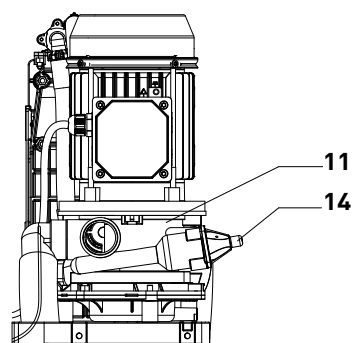
RECOMMENDED CHECKS EVERY 12 MONTHS

- Check maximum recorded temperatures and all alarms. Intervene accordingly.
- Check the aspirator noise level, max. 72 dB according to standard 3047 (E).
- If necessary, use a blast of dry air with max. 2 bar pressure to remove dust from the electronic components of the circuit using a blast of dry air and a 6 bar blast of air to clean the small holes on the frontal cover of the aspirating assembly **(15)**.
- Check the condition of plastic hoses, in particular the hoses under pressure connecting the centrifugal separator **11** and the Hydrocyclone ISO. We recommend replacing these hoses every 12-18 months.



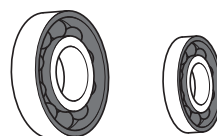
RECOMMENDED CHECKS EVERY 18-24 MONTHS

- Check the efficiency of the centrifugal separator **(11)** and of the recirculation valve **(14)**.



RECOMMENDED CHECKS EVERY 10,000 HOURS

- Rubber parts: O rings, gaskets or seals must be replaced every time they are removed.
- Replace motor bearing and vibration dampers.
- If routine maintenance is not carried out properly or unsuitable products are used, train the staff and inform the person in charge.



INSTRUCTIONS FOR ADJUSTING SOME OF THE PARAMETERS IN THE MENUS OF SMART ASPIRATORS

MAIN MENU



When the control unit is switched on, the graphic display will show the Cattani logo for 10 seconds, then the main menu will appear.

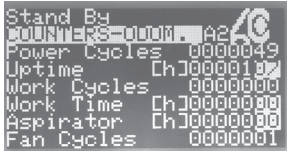
MAIN MENU "A1"




This menu shows parameters such as: operation frequency, suction activation time, temperature, presence/absence of amalgam container and system software revision.

Press the arrow on the right  to access Menu A2.

CONTROL MENU "A2"




This menu shows: the number of times the machine has been switched on, the total hours it was on, the number of times suction was activated, the total running hours of the aspirator, the working hours in relation to the frequency and number of times the fan was activated.

Arrow on the right .

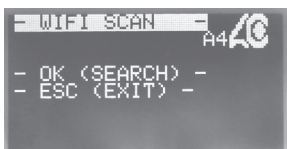
EVENTS MENU "A3"



This menu shows the last events or alarms occurred. The events are indicated by a number, the table on page 35 gives the key.

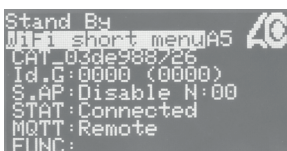
Arrow on the right .

WIFI SCAN MENU "A4"



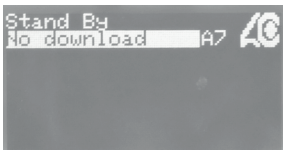
In this menu, you can scan for any WiFi networks within range.

MENU WI FI SHORT MENU "A5"



You can check the status of your Wi Fi connection.

MENU DOWNLOAD MENU "A7"



You can check if there are any downloads available to update the firmware.


CONTROL MENU "A2"

Counters – Odom . A2

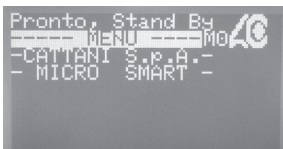
Power Cycles	00000	Number of times switched on with master switch
Uptime [h]	00000	Total hours switched ON (with motors not running)
Work Cycles	00000	Number of times activated by suction control
Work Time [h]	00000	Actual hours of operation (motors running)
Aspirator [h]	00000	Hours of operation in relation to frequency
Fan Cycles	00000	Number of times the control panel cooling fan was switched on

SECONDARY MENUS



Press  to access the secondary menus.

From this menu click the arrow at the bottom to access the following menus 

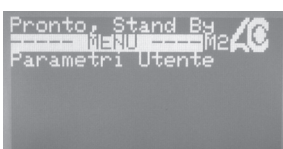


DRIVE STATUS



This menu can be accessed without a password. The display shows useful information about operation.

USER PARAMETERS



To access this menu, enter the password "0000123000".

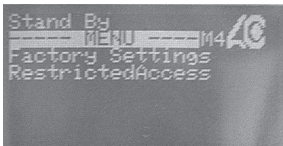
You can change vacuum level setpoint, select the language, read the Generated Code and access the Activation menu.

SYSTEM PARAMETERS SETUP



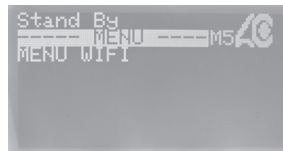
To access this menu, enter the password "0000456000".
You can change switch-off delay time and other technical parameters.

FACTORY SETTINGS RESTRICTED ACCESS



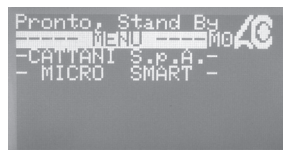
This menu is reserved for exclusive use by Cattani.

WI FI SETTINGS



You can access this menu without a password to change WiFi parameter settings.



ENTERING ACCESS PASSWORD

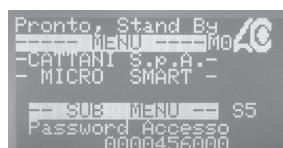


Drive Status is the only menu that can be viewed without entering a password. To access the "User Parameters" and "System Parameters Setup" menus, a password must be entered.


Password for accessing "User Parameters" menu: "0000123000". Password for accessing "System Parameters Setup" menu: "0000456000".






At the "CATTANI S.p.A." screen, press the arrow  then  the display will show the menu "Access Password" 0000000000.





Press Enter  the cursor will appear on the 0 at the right.

Press  to move the cursor to the sixth 0.

Press  and 1 will appear.

Press  move on the 0 next to it and  with type 2.

Press  move on the 0 next to it and  with type 3.



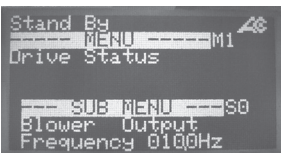
Press Enter  to confirm the Password and the cursor will disappear.

Press  to go back to the "Cattani S.p.A." menu.

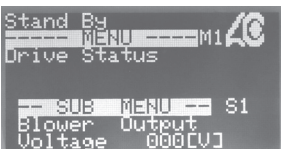
You will now be able to change the parameters of the "User Parameters" menu. Repeat the same procedure to enter the password 0000456000 in order to make changes in the "System Parameters Setup" menu.

"INVERTER STATUS" MENU

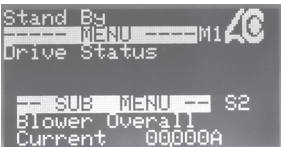
No password is needed to access this menu. Its function is to display some of the parameters on the operation status of the aspirator, such as:



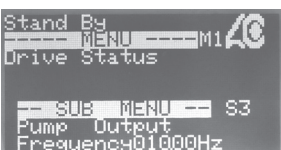
Blower frequency



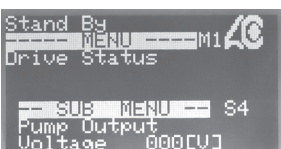
Blower output voltage



Blower current



Centrifugal separator frequency



Centrifugal separator output voltage

```
Stand By
----- MENU ----- M1
Drive Status

-- SUB MENU -- S5
Pump Overall Bus
Current 00000A
```

Centrifugal separator current

```
Pronto, Stand By
----- MENU ----- M1
Stato Inverter

-- SUB MENU -- S6
Temperatura
Dissipatore 34,8°C
```

System temperature

```
Pronto, Stand By
----- MENU ----- M1
Stato Inverter

-- SUB MENU -- S7
Massima Temperat
Memorizzata 36,2°C
```

Maximum recorded temperature (to reset use code 19404 in menu drive commands)

```
Pronto, Stand By
----- MENU ----- M1
Stato Inverter

-- SUB MENU -- S8
Massima Temperat
Assoluta 36,2°C
```

Maximum recorded temperature

```
Pronto, Stand By
----- MENU ----- M1
Stato Inverter

-- SUB MENU -- S9
Tensione Bus
Potenza 309 U
```

Bus voltage

```
Pronto, Stand By
----- MENU ----- M1
Stato Inverter

-- SUB MENU -- S10
Massima Tensione
BUS Memoriz. 323U
```

Maximum recorded bus voltage

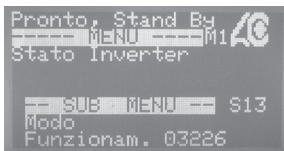
```
Pronto, Stand By
----- MENU ----- M1
Stato Inverter

-- SUB MENU -- S11
Ripple Bus
Potenza 000 U
```

Ripple bus voltage

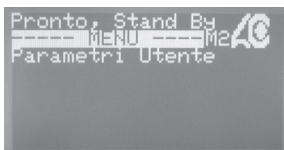


Instantaneous vacuum level

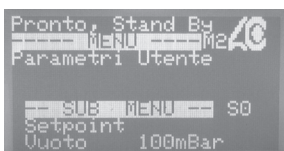


Operation mode (describes how the machine must work)

"USERS PARAMETERS" MENU



To access this menu, enter the Access Password 0000123000 (see instructions on page 24).

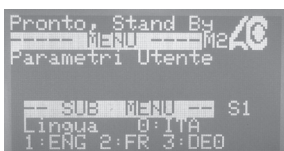


Vacuum set point - Vacuum level -

Show the maximum vacuum level setting.

Press Enter to make changes, use the arrows to set the desired value.

Press Enter to confirm the change.

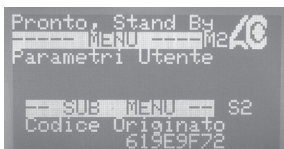


Language -

You can select Italian (0), English (1), French (2), Spanish (3), German (4) or Russian (5).

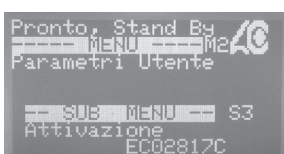
Press Enter and use the arrows to select 0 or 1 or 2 or 3 or 4 or 5.

Press Enter to confirm the change.



Generated code -

This code is generated by Cattani. Each appliance has a unique code.



Activation code - If used

“SYSTEM PARAMETERS SETUP” MENU



To access this menu, enter the Access Password 0000456000 (see instructions on page 24). You can now change some of the settings.

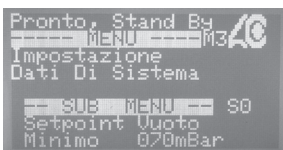
To change the parameters in this menu:

Use the arrows to scroll the menus and highlight the parameters you want to change.

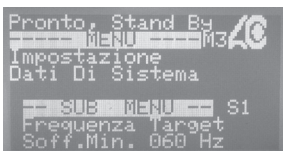
Press Enter to activate the cursor, use the arrows to set the value

Press Enter to confirm the change.

All the parameters can be adjusted:



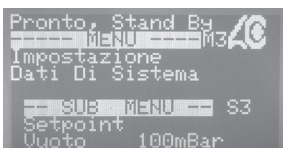
Minimum vacuum level (only Micro Smart and Micro Smart Cube)



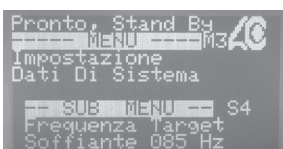
Maximum blower frequency for minimum vacuum level (only Micro Smart and Micro Smart Cube)



Blower current limit for minimum vacuum level (only Micro Smart and Micro Smart Cube)



Medium vacuum level (only Micro Smart and Micro Smart Cube)



Maximum blower frequency for medium vacuum level (only Micro Smart and Micro Smart Cube)

```

Pronto, Stand By
----- MENU ----- M3 AC
Impostazione
Dati Di Sistema

-- SUB MENU -- S5
Limite Corrente
Soffiante 025A

```

Blower current limit for medium vacuum level (only Micro Smart and Micro Smart Cube)

```

Pronto, Stand By
----- MENU ----- M3 AC
Impostazione
Dati Di Sistema

-- SUB MENU -- S6
Setpoint Vuoto
Chirurg. 210mBar

```

Surgery vacuum level (only Micro Smart and Micro Smart Cube)

```

Pronto, Stand By
----- MENU ----- M3 AC
Impostazione
Dati Di Sistema

-- SUB MENU -- S7
Frequenza Target
Chirurgical 100 Hz

```

Maximum blower frequency for surgery vacuum level (only Micro Smart and Micro Smart Cube)

```

Pronto, Stand By
----- MENU ----- M3 AC
Impostazione
Dati Di Sistema

-- SUB MENU -- S8
Limite Corrente
Soff. Chir. 035A

```

Blower current limit for surgery vacuum level (only Micro Smart and Micro Smart Cube)

```

Pronto, Stand By
----- MENU ----- M3 AC
Impostazione
Dati Di Sistema

-- SUB MENU -- S9
Ritardo
Spegnim. 010s

```

Switch off delay (max. 300 S)

```

Pronto, Stand By
----- MENU ----- M3 AC
Impostazione
Dati Di Sistema

-- SUB MENU -- S10
Ritardo Spegnim.
Pompa 05000t

```

Pump switch off delay (max. 3600 t)

```

Pronto, Stand By
----- MENU ----- M3 AC
Impostazione
Dati Di Sistema

-- SUB MENU -- S11
Ritardo Spegnim.
Ventola 0300s

```

Fan switch off delay (set 150 S)

```
Pronto, Stand By
----- MENU ----- M3 AC
Impostazione
Dati Di Sistema
-- SUB MENU -- S12
Opzioni
Utilizzate 00000
```

Options used

Enables or disables reading of amalgam sensor.

0- without amalgam separator

1- with amalgam separator

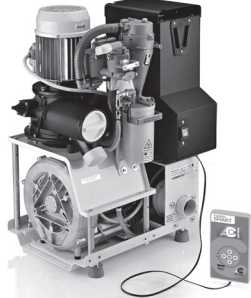
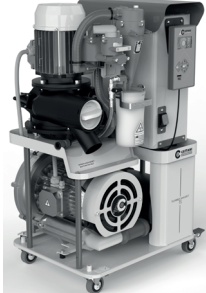
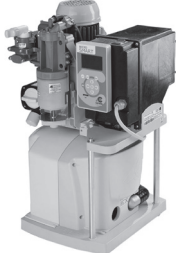
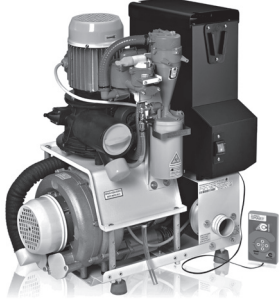

```
Pronto, Stand By
----- MENU ----- M3 AC
Impostazione
Dati Di Sistema
-- SUB MENU -- S13
Comandi ad
Inverter 00000
```


Inverter controls.

Reserved for factory settings

CONFIGURATION INSTRUCTIONS

WI-FI COMMUNICATION (WIRELESS)

Available in models	Notes	
<p>Turbo Smart (produced from October 2015)</p>	<p>from serial number WP5xxxxx (new keypad with external, removable display)</p>	
<p>Turbo Smart TS</p>		
<p>Micro Smart (produced from October 2015)</p>	<p>from serial number WM3xxxxx</p>	
<p>Turbo Smart 2V (produced from September 2017)</p>		
<p>Turbo Smart Cube</p>		

Available in models	Note	
Micro Smart Cube		



Turbo Smart, Turbo Smart TS, Turbo Smart 2V, Turbo Smart Cube, Micro Smart and Micro Smart Cube can be controlled by a professional using **SmartApp**.

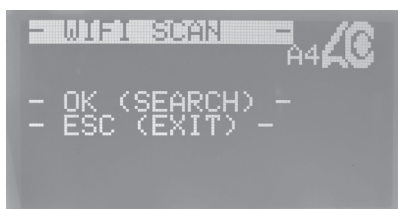
SETTING UP THE CONNECTION AND COMMUNICATION IN THE ASPIRATOR



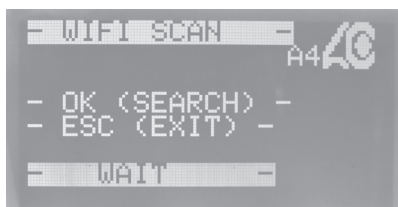
When power is switched on, the display will show this picture.


Menu "A1"

WI-FI OFF



Press  towards Menu "A4" WI-FI SCAN




Press  and wait for network searching to be carried out.


```

TERM-WL
BADGE
quest-wl
natewifi
RPO6E6E0
HP-Print-82-LaserJet

```

Once completed, it will show all the WI-FI networks available in the area.

Select the network using the UP and DOWN network and then confirm. 

```

Stand By
MICRO SMART A1
2000
Oh WIFI OFF
ID: 2
155°C 10036
00010050

```



Once you have selected the WI-FI network, the display will go back to the main menu A1 in a couple of seconds.

Now press enter. 

```

Stand By
MENU M0
-CATTANI S.p.A.-
-SMART SYSTEM-

```

In the M0 menu, use the arrows,   to scroll down to the WI-FI M5 menu.

```

Stand By
MENU M5
MENU WIFI

```

To access the Menu press 

```

Stand By
MENU M5
MENU WIFI

-- SUB MENU -- S0
ACTUAL IP ADDR
192.168.120.002

```

The WI-FI menu now shows (in S0) the non-changing IP address (IP dynamic).

```

Stand By
MENU M5
Menu WiFi

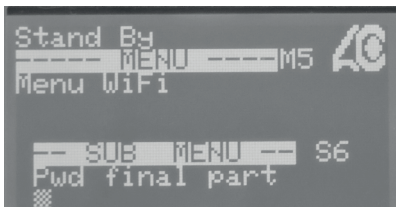
-- SUB MENU -- S4
SSID:
TEST

```

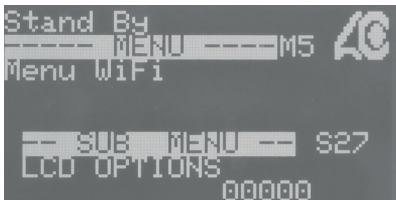
In the WI-FI menu you can check the network selected in SSID M5 S4.



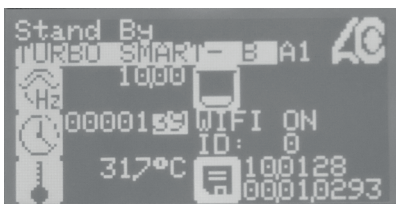
In Menu M5-S5, you can enter the password for the WI-FI router, using the arrows.



Using the arrows in the M5 S6 Menu you can enter the final part of the password if it is too long.



Check that LCD Options is set to 1. If you want the DHCP to be fixed set to 8.



Now press the left arrow and then ESC to return to the Main menu A1 where you can see WI-FI ON.



ALARM DESCRIPTION

Alarm codes		Description	Solution
00	0	Microcontroller memory alarm	Contact the technician
I00	32	Microcontroller memory alarm	Contact the technician
I01	33	Short circuit due to one of two motors	Find out where the short circuit is located and eliminate it
I02	34	Short circuit before motor control	Contact the technician (board probably damaged)
I03	35	Condensers not charged	Contact the technician (replace board)
I04	36	Temperature limit exceeded	Ventilate plant room
I05	37	Blower has exceeded current limit	Check blower efficiency (seized or excessive friction)
I07	39	Maximum voltage on condensers exceeded	Check mains voltage max. 260V
S08	40	Short-circuit in centrifuge	Eliminate the short-circuit
S09	41	Board short-circuit in centrifuge output	Replace board
S10	42	Instantaneous centrifuge has exceeded current limit	Eliminate siphons in piping or check efficiency of centrifuge (seized or excessive friction)
S11	43	Time-delayed centrifuge has exceeded current limit	Eliminate siphons in piping or check efficiency of centrifuge (seized or excessive friction)
I13	45	Amalgam reader disconnected	Connect the amalgam sensor
I14	46	Exceeded 95% amalgam level	Replace amalgam container as soon as possible
I15	47	Exceeded 100% amalgam level	
I16	48	Vacuum sensor tube disconnected	Connect the vacuum tube to the centrifuge
I17	49	Thermal protector tripped	Reset plant room temperature
I22	54	Aspirator thermal switch open	Restore the operating conditions



IMPORTANT WARNINGS

TRANSPORT AND STORAGE

TRANSPORT OF USED APPLIANCES

IMPORTANT WARNINGS

- The appliances are under warranty for one year from the date of sale, provided that it is returned to the manufacturer with the warranty slip showing date of sale, seller and name of user/customer.
- The warranty and manufacturer's liability shall be invalidated if the appliances are treated with unsuitable products or products other than those specified by the manufacturer, if they are used improperly and in case of tampering of any kind carried out by persons not authorized by the manufacturer.
- The manufacturer, dealers, agents and authorized technicians are available to provide advice, instructions and supply documentation, spare parts and anything else you may need.
- The manufacturer may need to implement

production changes without prior notice as a result of technical requirements, product improvement efforts, regulatory and functional issues or difficulty in sourcing products or semi-finished materials.

- **Updated** manuals are available on our website www.cattani.it. We recommend you refer to these especially for the latest **safety** updates.
- Smart systems are EEE appliances and as such subject to WEEE (Waste Electrical and Electronic Equipment) regulations.

TRANSPORT AND STORAGE

- During transport and storage, the packed equipment can withstand temperatures in the - 10°C and + 60 °C range.
- Packages cannot be exposed to water and spraying

and cannot withstand humidity above 70%.

- The packages may be stacked only up to three rows having the same weight.

TRANSPORT OF USED APPLIANCES

- Before packing, clean and disinfect the aspirator with Puli-Jet plus 2.0 (see chapters on "Signals and warnings" and "Routine maintenance").
- Drain all the tubes and inlets/outlets as liquid residues (including disinfectant) may damage the control unit. Remove the amalgam tank, add the disinfectant, close the tank with the watertight lid. Dry the aspirator inside and

outside, close all machine inlets and outlets with the special plugs, install a new amalgam tank, wrap the appliance and the control unit separately, to ensure maximum protection from humidity.

- Place the machine in a polyethylene bag, seal and pack it in triple wall corrugated cardboard.

WASTE DISPOSAL

INFORMATION FOR PROFESSIONAL USERS

- Pursuant to art. 13 Legislative Decree no.151 25 July, "Implementation of directive 2011/65 EU ROHS and 2003/108/CE, concerning reduction of the use of dangerous substances in electrical and electronic appliances, and waste disposal".

The crossed out bin symbol on the appliance indicates that at the end of its useful life, the appliance must be disposed of separately from other waste. Separate disposal of this appliance at the end of its life is organized and managed by the manufacturer. Users wanting to dispose of this appliance must therefore contact the manufacturers and follow the system adopted by them to enable separate disposal of the appliance at the end of its life.

Adequate separate disposal for subsequent recycling of the appliance, processing and environmentally compatible disposal contributes to the prevention

of negative effects on the environment and on human health and promotes reuse and/or recycling of the materials with which the appliance is made. Improper disposal of the product by the user shall result in the administrative sanctions set forth by current regulations.



ELECTROMAGNETIC COMPATIBILITY CONFORMITY LEVELS PER STANDARD EN 60601-1-2:2015

ELECTROMAGNETIC COMPATIBILITY CONFORMITY LEVELS PER STANDARD EN 60601-1-2:2015

- ESD Immunity 15kV air 8kV contact (EN 61000-4-2)
- Burst immunity 2kV/100kHz (EN 61000-4-4)
- Surge immunity (EN 61000-4-5): 1kV common/2kV differential
- Magnetic field (EN 61000-4-8): 30A/m
- RF immunity within range 150kHz-80MHz (EN 61000-4-6) 3V modulation 80% 1kHz 6V modulation 80% 1kHz for the following frequency range: 6.765 Mhz ÷ 6.795 MHz 13.553 Mhz ÷ 13.567 MHz 26.957 Mhz ÷ 27.283 MHz 40.66 Mhz ÷ 40.70 MHz
- CISPR 11 class B Emissions
- Harmonics EN 61000-3-2 class A
- Flicker pst, dt, dc

Immunity to RF fields (EN 61000-4-3):		
Field (V/m)	Frequency	Modulation
3	80MHz-2700MHz	1kHz AM 80%
27	380MHz-390MHz	18Hz PM 50%
28	430MHz-470MHz	18Hz PM 50%
9	704MHz-787MHz	217Hz PM 50%
28	800MHz-960MHz	18Hz PM 50%
28	1700MHz-1990MHz	217Hz PM 50%
28	2400MHz-2570MHz	217Hz PM 50%
9	5100MHz-5800MHz	217Hz PM 50%

Warnings:

Although compliant with standard EN 60601-1-2, the medical device can interfere with other nearby equipment. The device must never be used in the proximity or be stacked on top of other equipment. Install the device away from other equipment emitting high frequency (short waves, microwaves, electro surgery unit, cellular telephones).

The equipment is intended for use in an electromagnetic environment where the RF radiated disturbances are under control. The customer or operator may contribute to prevent such electromagnetic interferences by maintaining a minimum distance between mobile and RF portable communication devices (transmitters) and the medical equipment, as recommended below, in reference to the maximum output power of radio communication devices.

ELECTROMAGNETIC COMPATIBILITY CONFORMITY LEVELS PER STANDARD EN 60601-1-2:2015

Rated maximum output power of transmitter (W)	Separation distance (m) based on frequency of the transmitter		
	from 150 kHz to 80 MHz $d = 1.2 \sqrt{P}$	from 80 MHz to 800 MHz $d = 1.2 \sqrt{P}$	from 800 MHz to 2.5 GHz $d = 2.3 \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

Transmitters with maximum rated output power not included above, the recommended separation distance d in metres (m) can be calculated by the equation applicable to the frequency of the transmitter, where P is the maximum rated output power of the transmitter in Watt (W) according to the transmitter's manufacturer.

Notes:

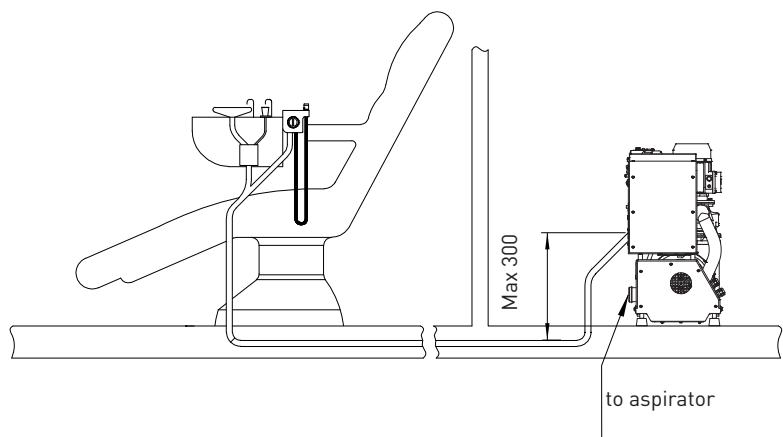
(1) For 80 MHz and 800 MHz the highest frequency interval is applied.

(2) These guidelines might not be applicable to all cases. Electromagnetic propagation is influenced by absorption and reflected from structures, objects and people.

INSTALLATION LAYOUT

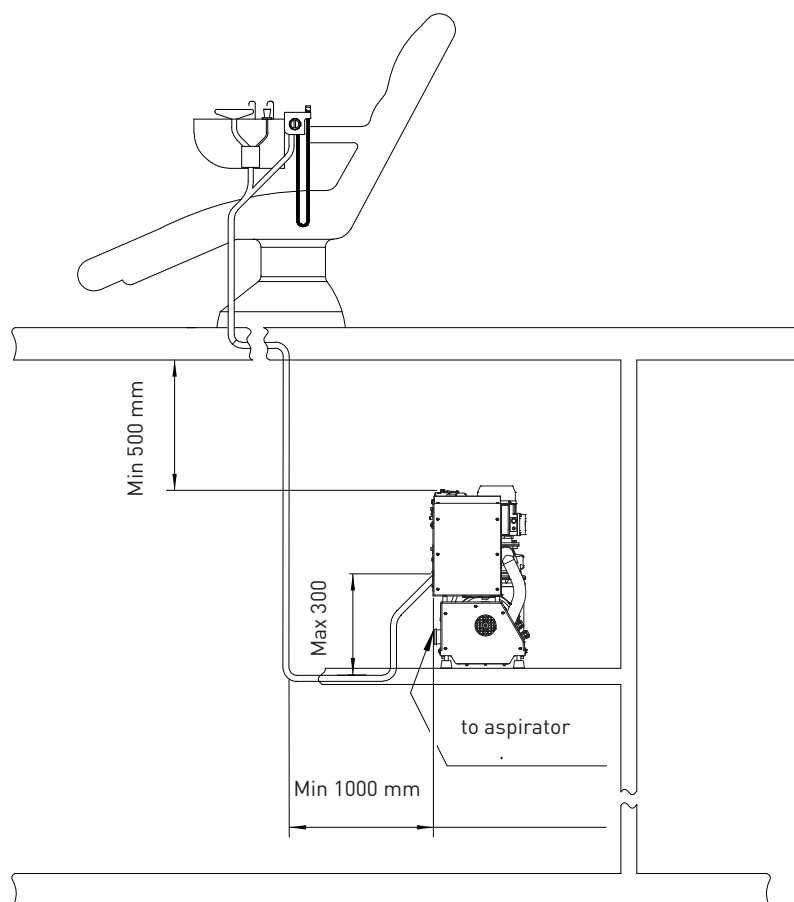
INSTALLATION ON SAME LEVEL

Fig. A



INSTALLATION ON A LOWER LEVEL

Fig. B



ELECTRICAL CONNECTIONS

MICRO SMART CIRCUIT

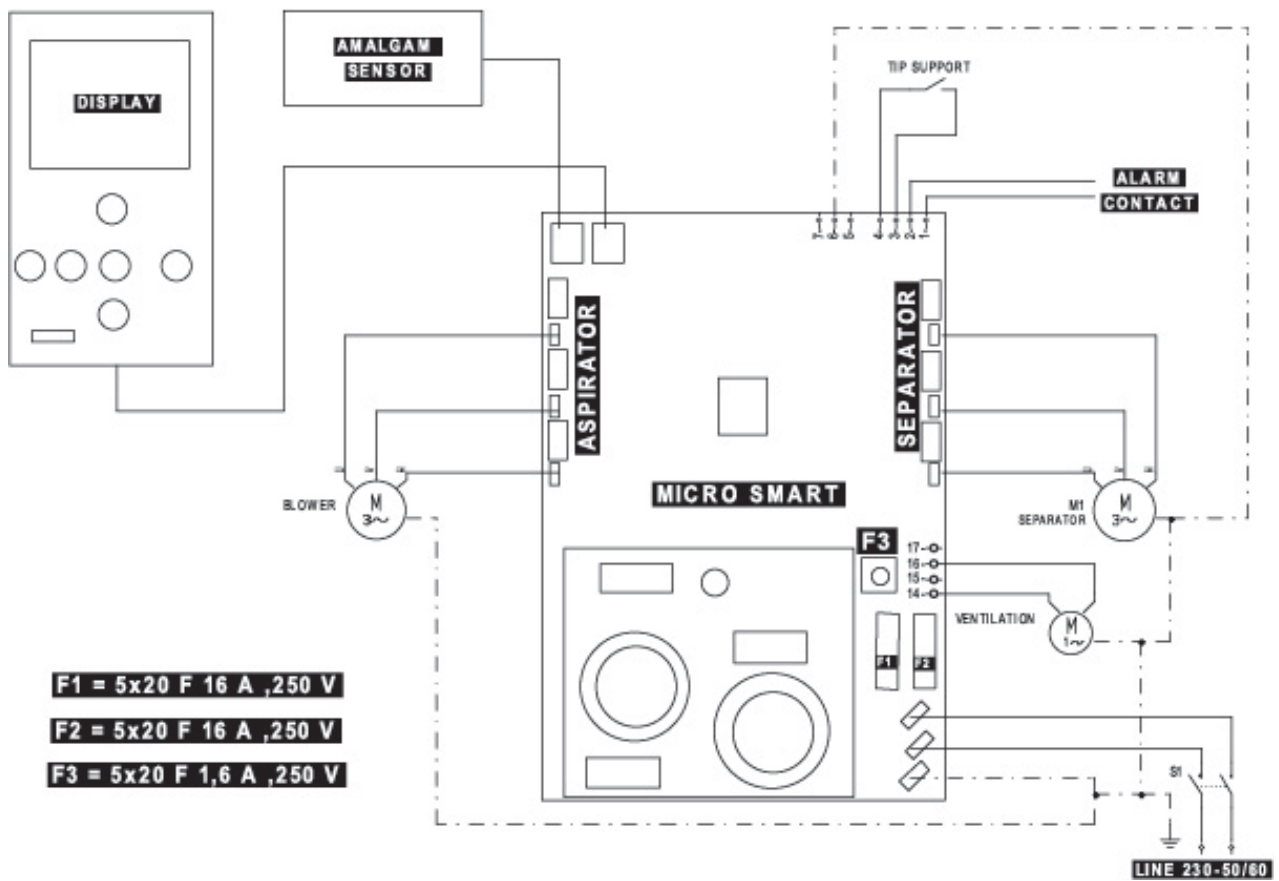


Fig. C

MICRO SMART CUBE CIRCUIT

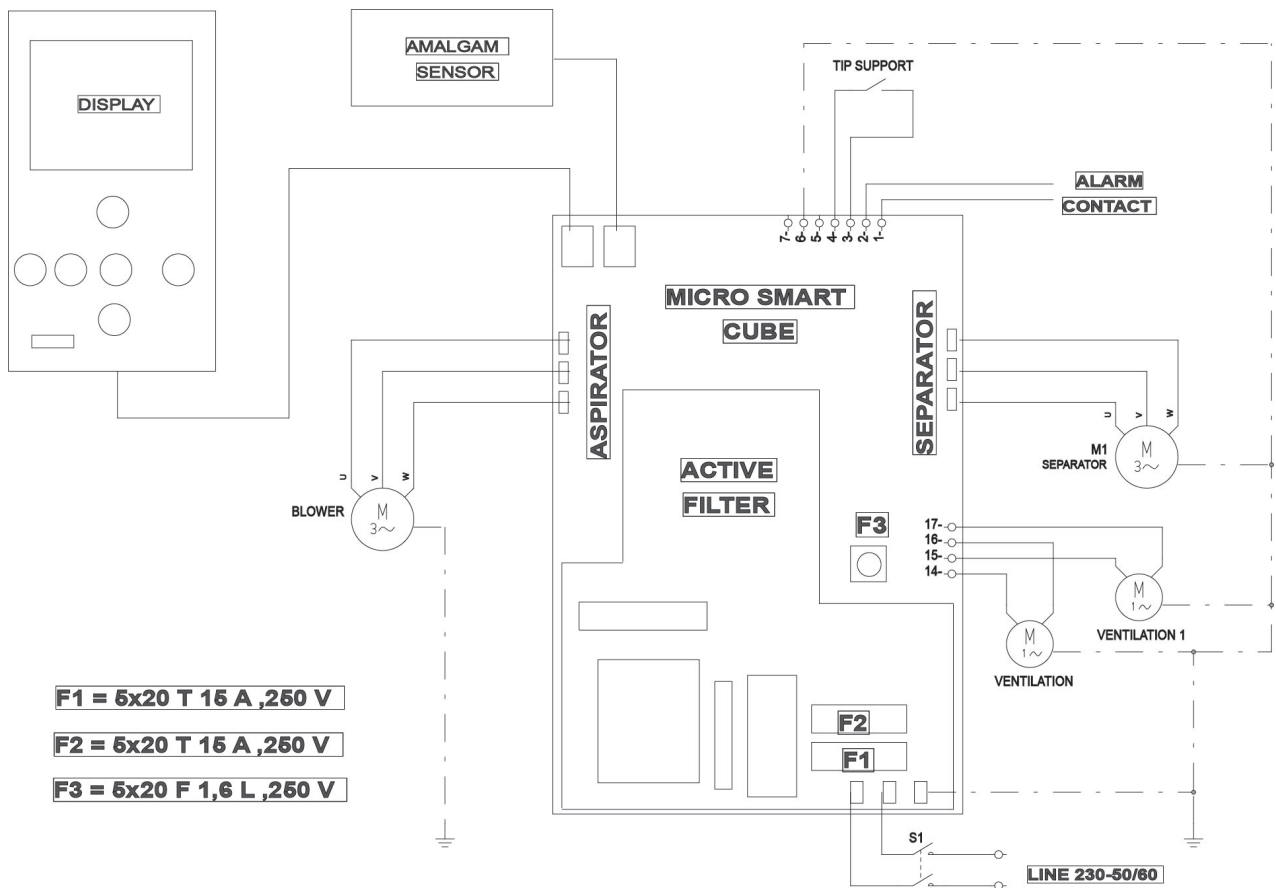


Fig. D

TURBO SMART, TURBO SMART 2V AND TURBO SMART CUBE CIRCUIT

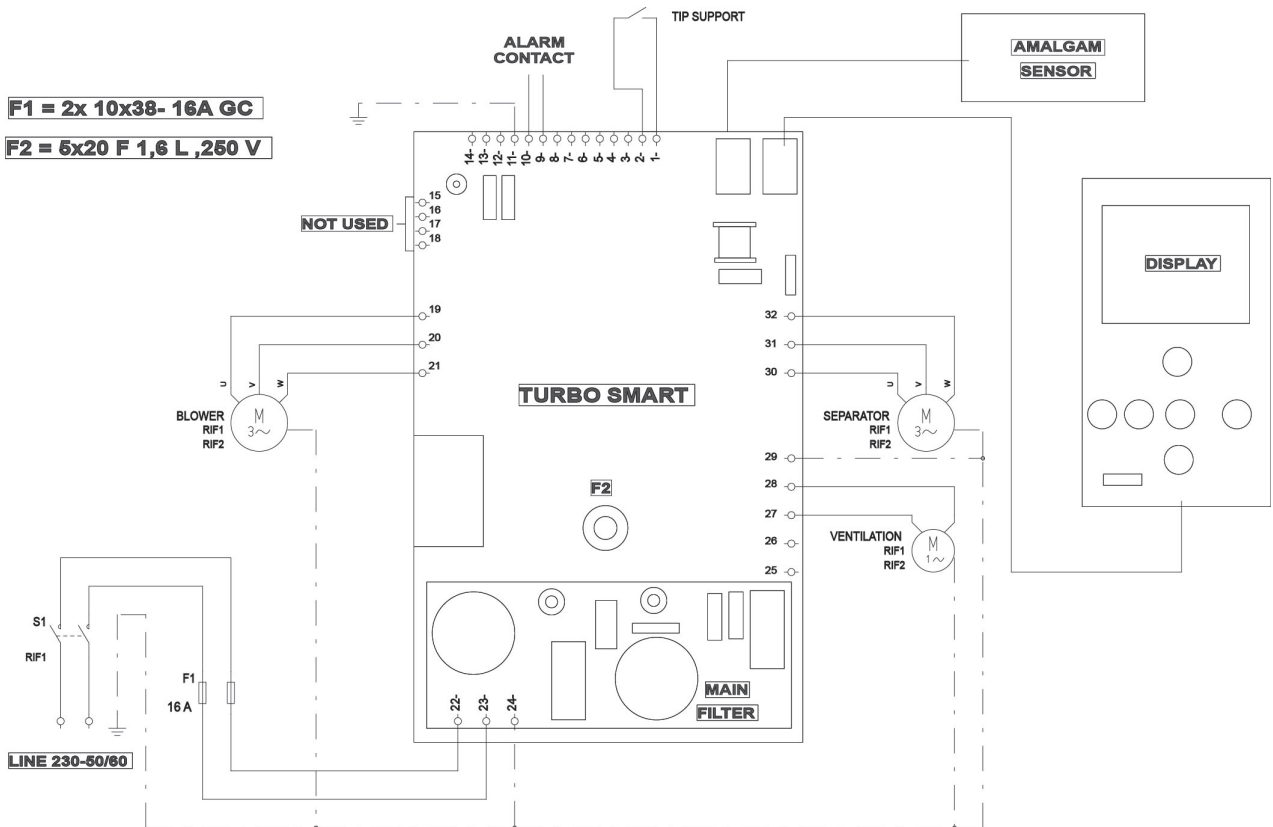


Fig. E

TURBO SMART TS CIRCUIT

F1 = 10X38 16A 500V
F2 = 10X38 16A 500V
F3 = 5X20 F 1,6A 250V

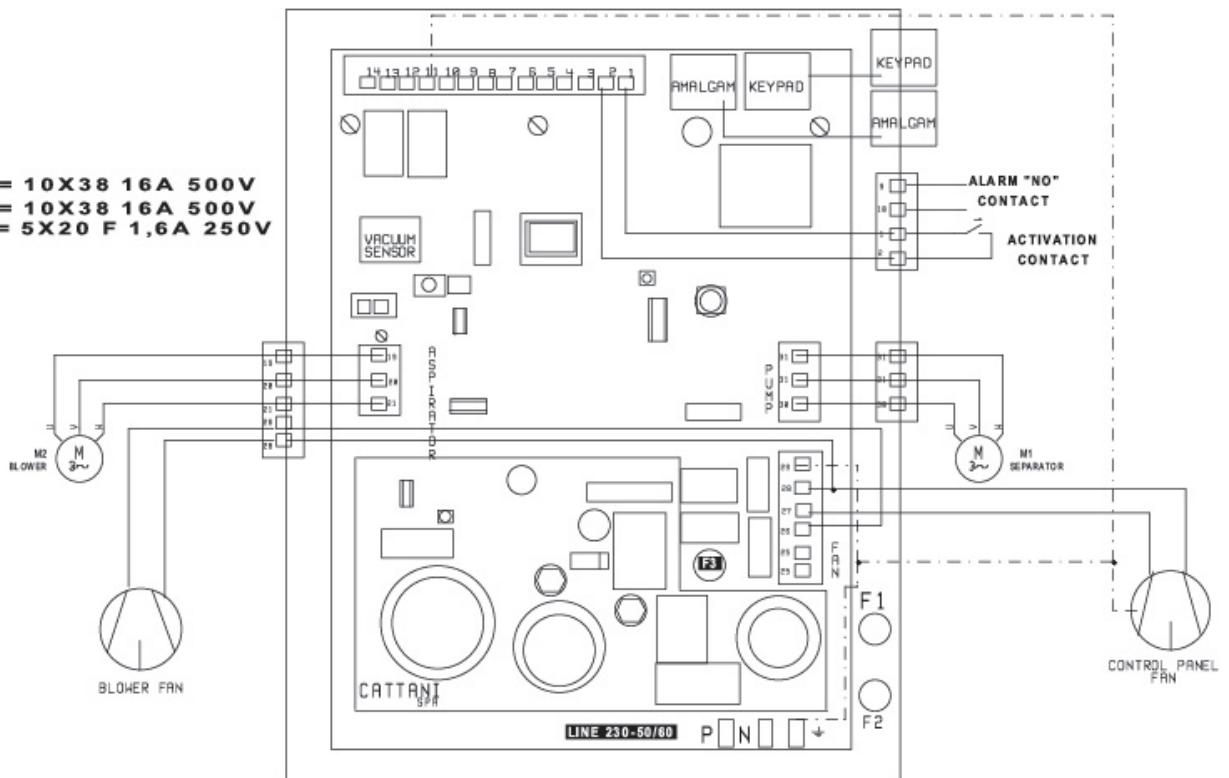


Fig. F

DEFAULT SETUP PARAMETERS FOR MICRO SMART AND MICRO SMART CUBE

Micro Smart	STEP 1 (minimum level)	STEP 2 (medium level)	STEP 3 (maximum level)
Vacuum level setpoint	70 mbar	100 mbar	210 mbar
Blower target frequency	60 Hz	85 Hz	120 Hz
Blower current limit	3,9 A	3,9 A	3,9 A
Centrifuge separator frequency	75 Hz	75 Hz	75 Hz
Centrifuge separator current limit	3,2 A	3,2 A	3,2 A

Micro Smart CUBE	STEP 1 (minimum level)	STEP 2 (medium level)	STEP 3 (maximum level)
Vacuum level setpoint	70 mbar	100 mbar	210 mbar
Blower target frequency	60 Hz	120 Hz	145 Hz
Blower current limit	3,7 A	3,7 A	3,7 A
Centrifuge separator frequency	75 Hz	75 Hz	75 Hz
Centrifuge separator current limit	3 A	3 A	3 A

Fig. G

DIAGNOSTIC TESTS ON TURBO SMART, TURBO SMART TS, TURBO SMART CUBE, TURBO SMART 2V, MICRO SMART AND MICRO SMART CUBE

To check that the Smart aspirator is working correctly, you can carry out a few dynamic tests, as described below.

The test needs to be carried out with the machine

in operation and with open suction inlet, i.e. not connected to piping. The other test must be carried out with the suction inlet closed.

Fig. H

Model	Frequency reached [Hz]	Head reached [mbar]	I Total [A]	I Centrifuge separator frequency [A]	Condition
Turbo Smart Version A	75 - 87	45 ÷ 55	2,9 - 4	0,9 ÷ 1,2	Suction inlet open
Turbo Smart Version B	95 - 110	65 - 75	4,3 - 5	0,9 ÷ 1,2	Suction inlet open
Turbo Smart Version A/B	65 - 75	190 - 210	4,3 - 5	0,9 ÷ 1,2	Suction inlet closed
<hr/>					
Turbo Smart TS Version A	80	30 - 35	3,80 - 3,90	1,65	Suction inlet open
Turbo Smart TS Version B	100	40 - 45	5,80 - 5,85	1,65	Suction inlet open
Turbo Smart TS Version A/B	45 - 50	200 - 210	3,60 - 3,65	1,65	Suction inlet closed
<hr/>					
Turbo Smart Cube Version A	130 - 140	45 - 60	4,3 - 5	1,3	Suction inlet open
Turbo Smart Cube Version B	150 - 165	60 - 80	4,3 - 5	1,3	Suction inlet open

Model	Frequency reached [Hz]	Head reached [mbar]	I Total [A]	I Centrifuge separator frequency [A]	Condition
Turbo Smart Cube Version A	80 - 95	190 - 210	5,2 - 5,8	1,3	Suction inlet closed
Turbo Smart Cube Version B	85 - 100	190 - 210	5,2 - 5,8	1,3	Suction inlet closed
Turbo Smart 2V	85 - 110	55 - 75	5,5 - 6,2	1,1	Suction inlet open
Turbo Smart 2V	50 - 70	260 - 280	5,8 - 7	1,1	Suction inlet closed
Micro Smart	120	55	2,4 - 3	0,8 - 1,2	Suction inlet open
Micro Smart	85	190 - 210	3,2 - 4	0,8 - 1,2	Suction inlet closed
Micro Smart Cube	145	71	2 - 2,6	0,8 - 1,2	Suction inlet open
Micro Smart Cube	80 - 95	190 - 210	2,2 - 3	0,8 - 1,2	Suction inlet closed

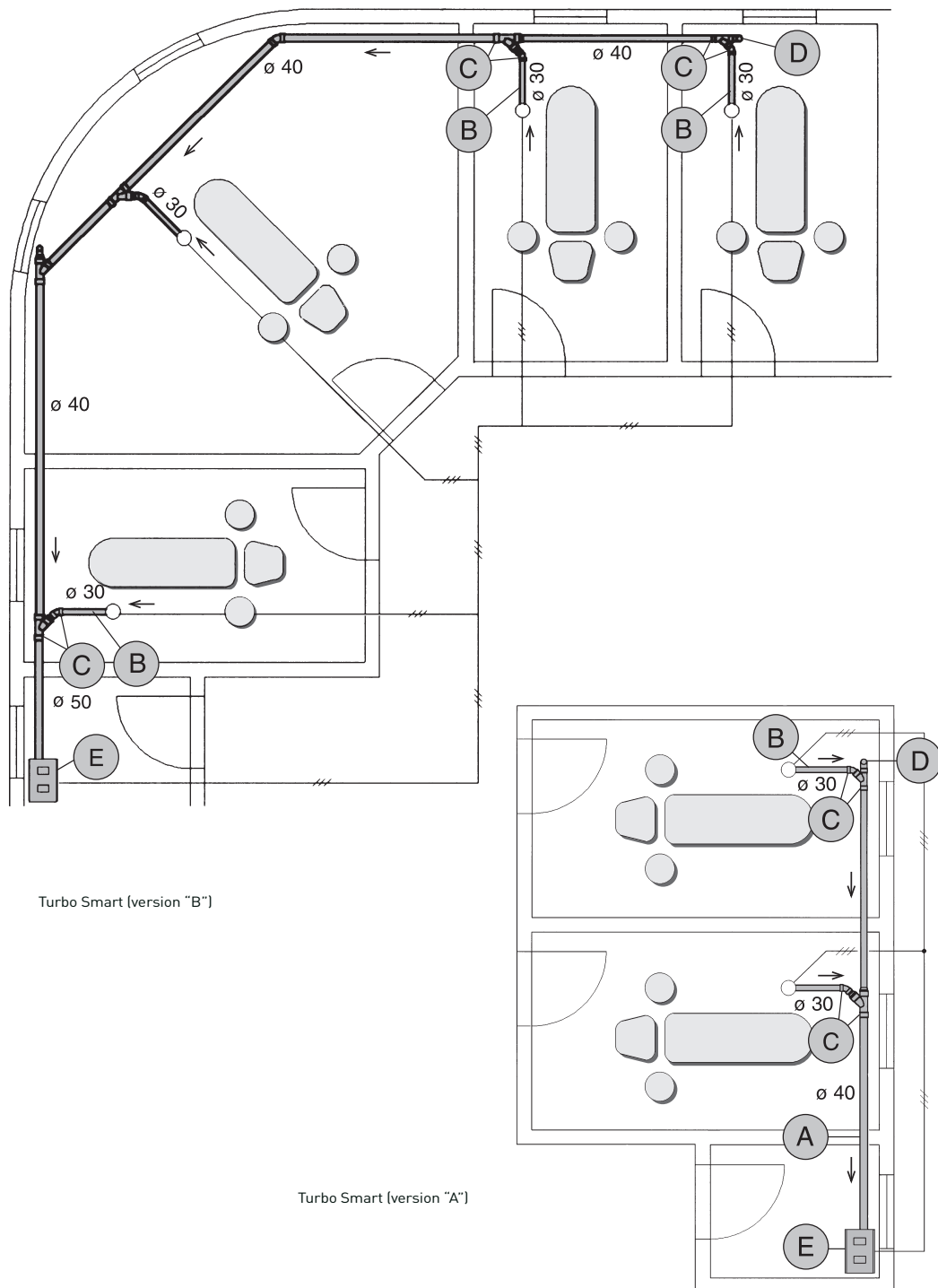


Fig. I

MICRO SMART EXPLODED-VIEW DRAWING

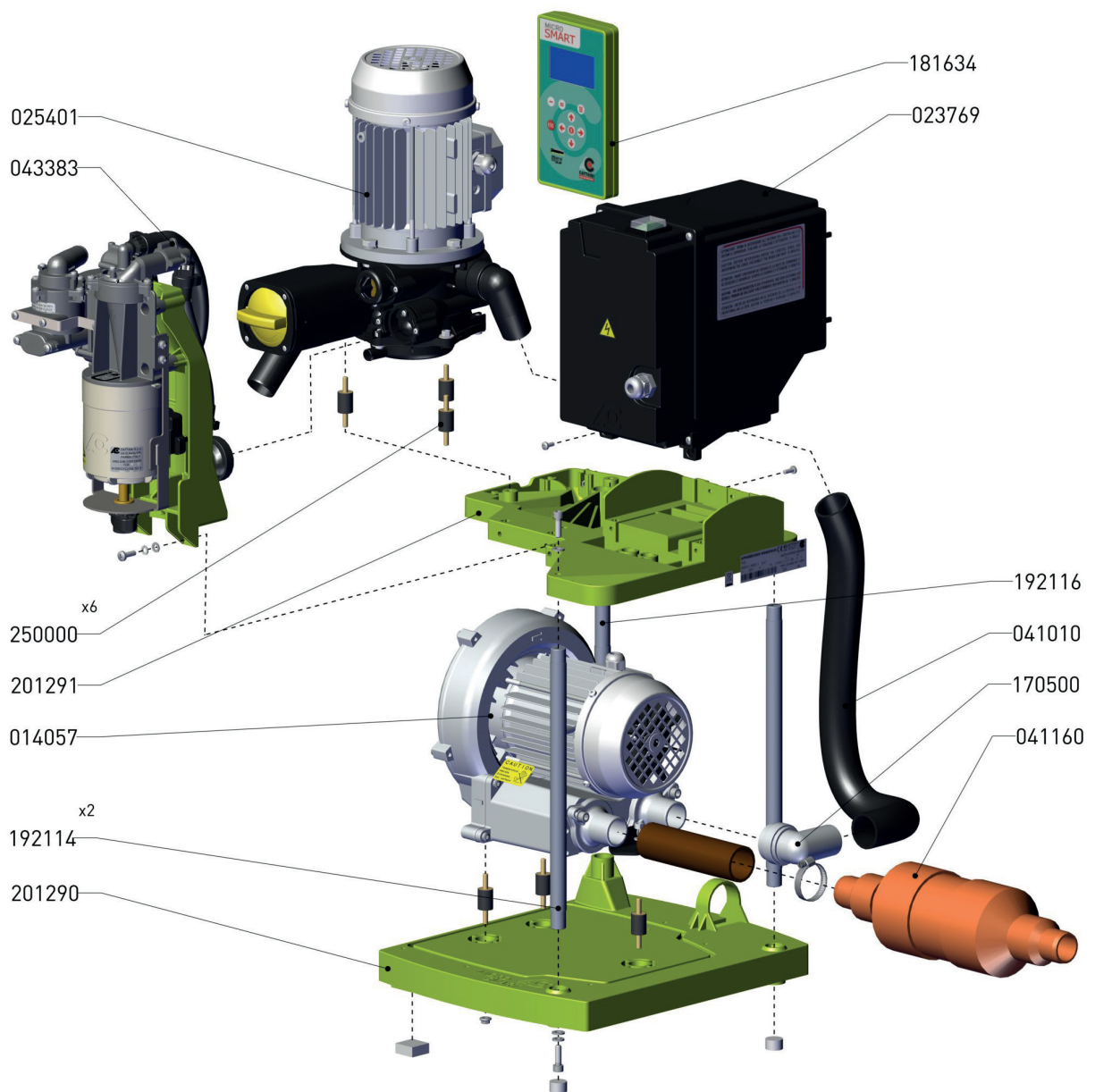


Fig. L

MICRO SMART CUBE EXPLODED-VIEW DRAWING

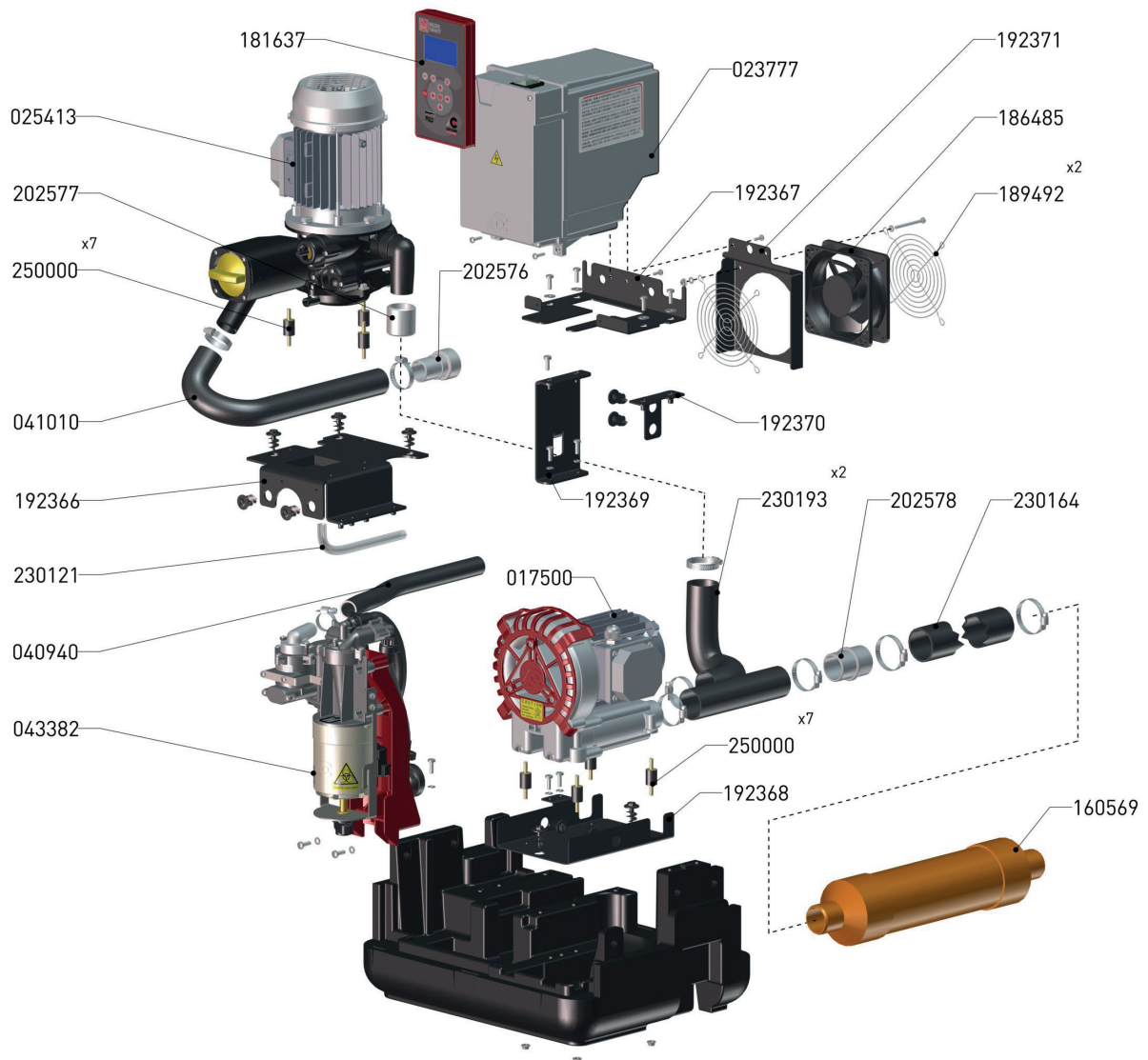


Fig. M

TURBO SMART EXPLODED-VIEW DRAWING

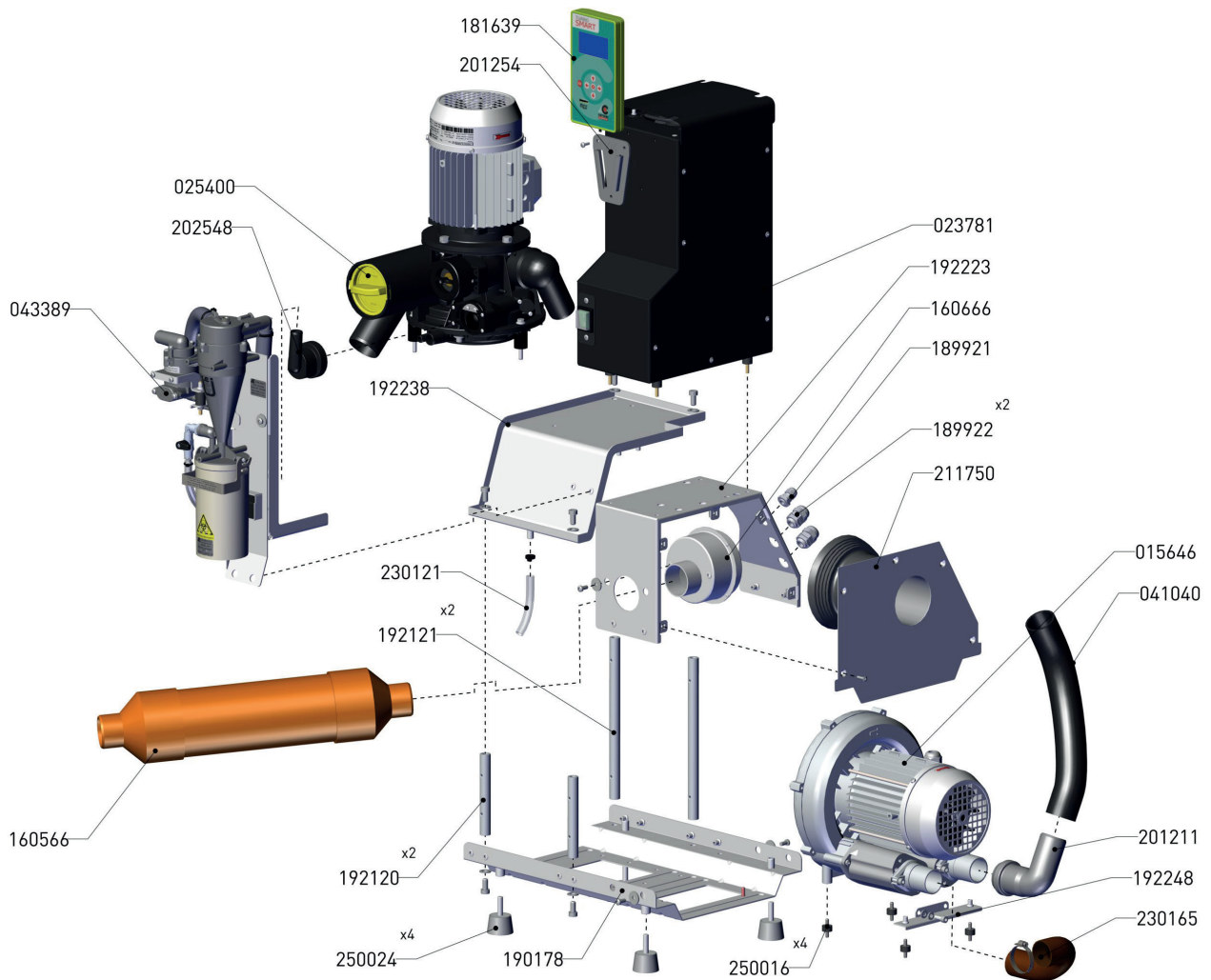
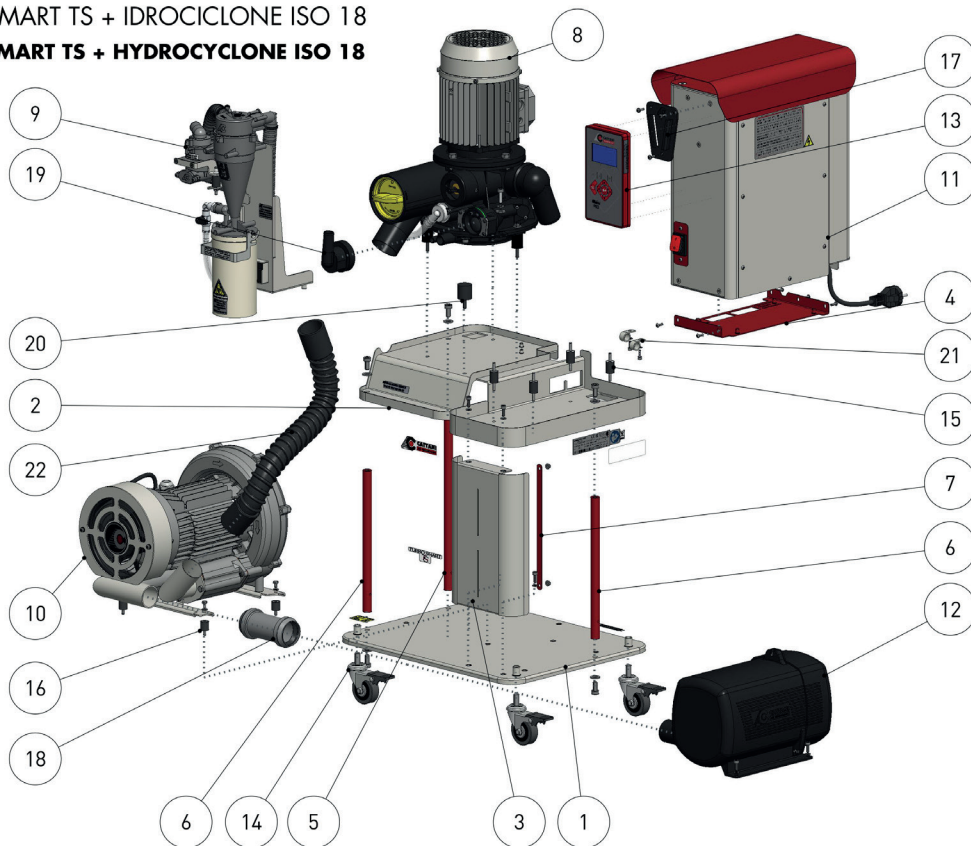


Fig. N

TURBO SMART TS EXPLODED-VIEW DRAWING



TURBO-SMART TS + IDROCICLONE ISO 18
TURBO-SMART TS + HYDROCYCLONE ISO 18



N°	Codice	Qta*
1	190190000	1
2	192440000	1
3	192451000	1
4	192438000	1
5	192107000	1
6	192109000	2
7	192449000	1
8	025431000	1
9	043398000	1
10	015668000	1
11	023744000	1
12	042098000	1
13	181673000	1
14	250454000	4
15	250000000	4
16	250037000	4
17	201254000	1
18	201929000	1
19	202548000	1
20	250039000	1
21	182295000	2
22	230209000	1



Fig. 0

TURBO SMART 2V EXPLODED-VIEW DRAWING

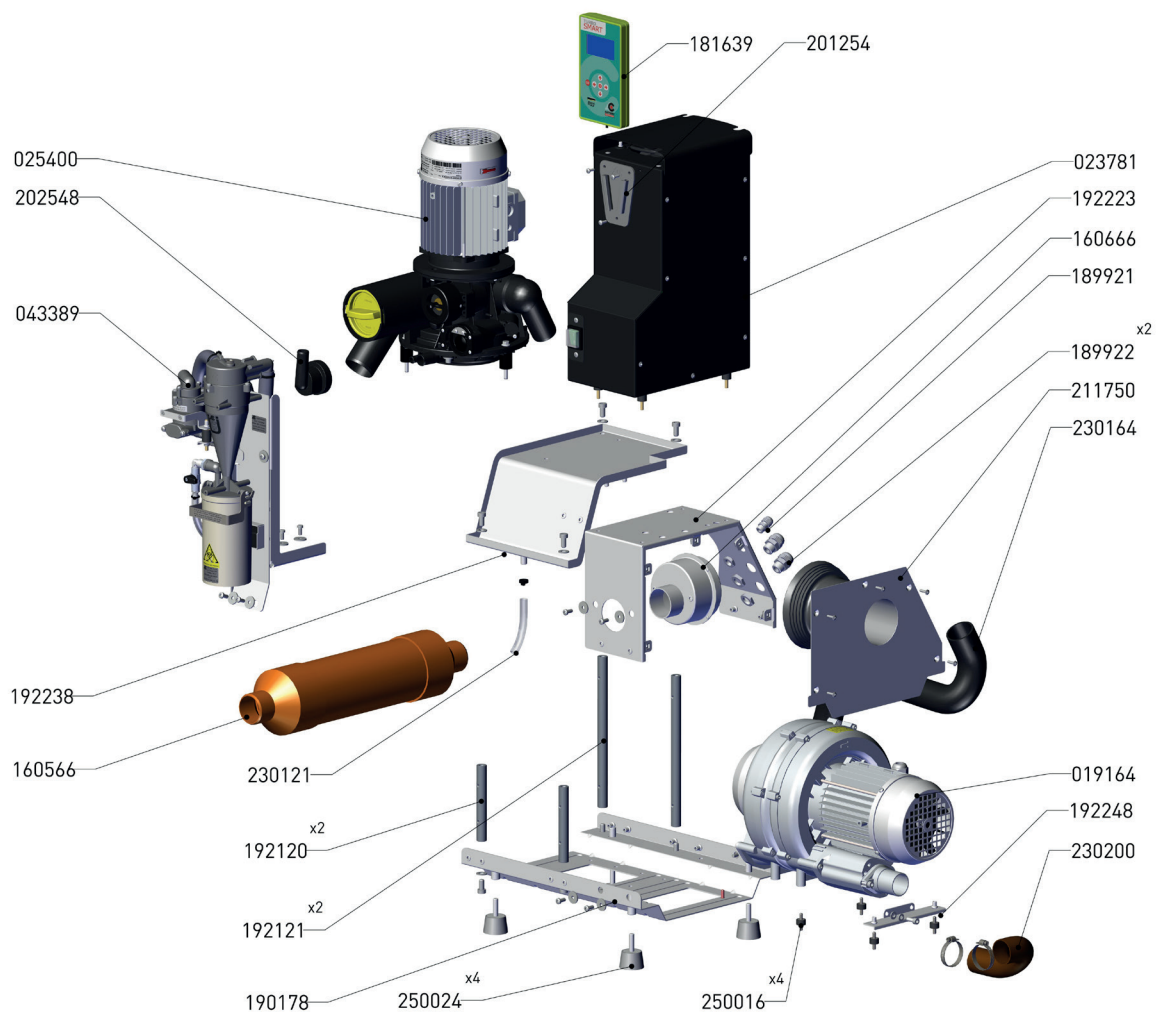


Fig. P

TURBO SMART CUBE EXPLODED-VIEW DRAWING

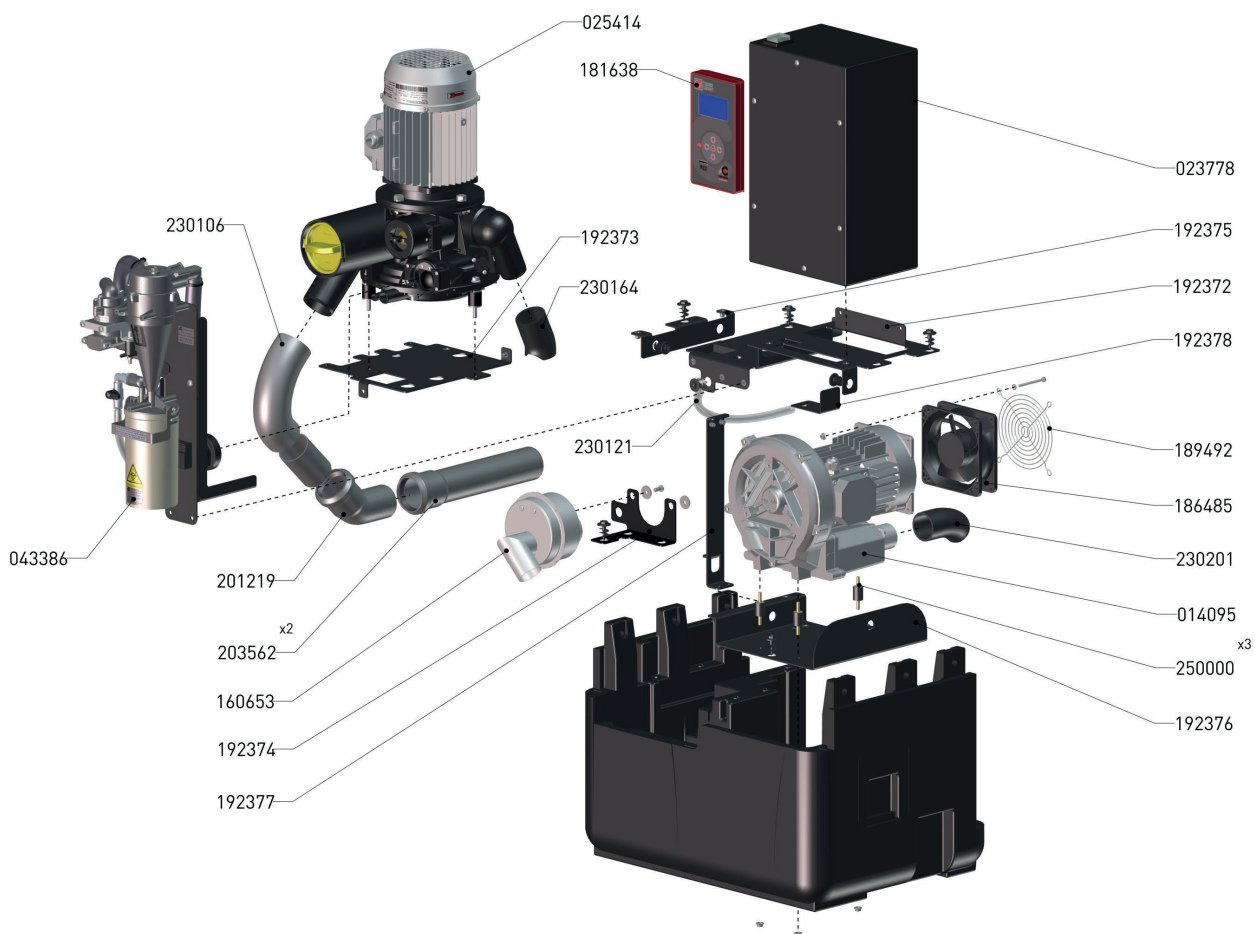


Fig. Q

MICRO SMART DIMENSIONS

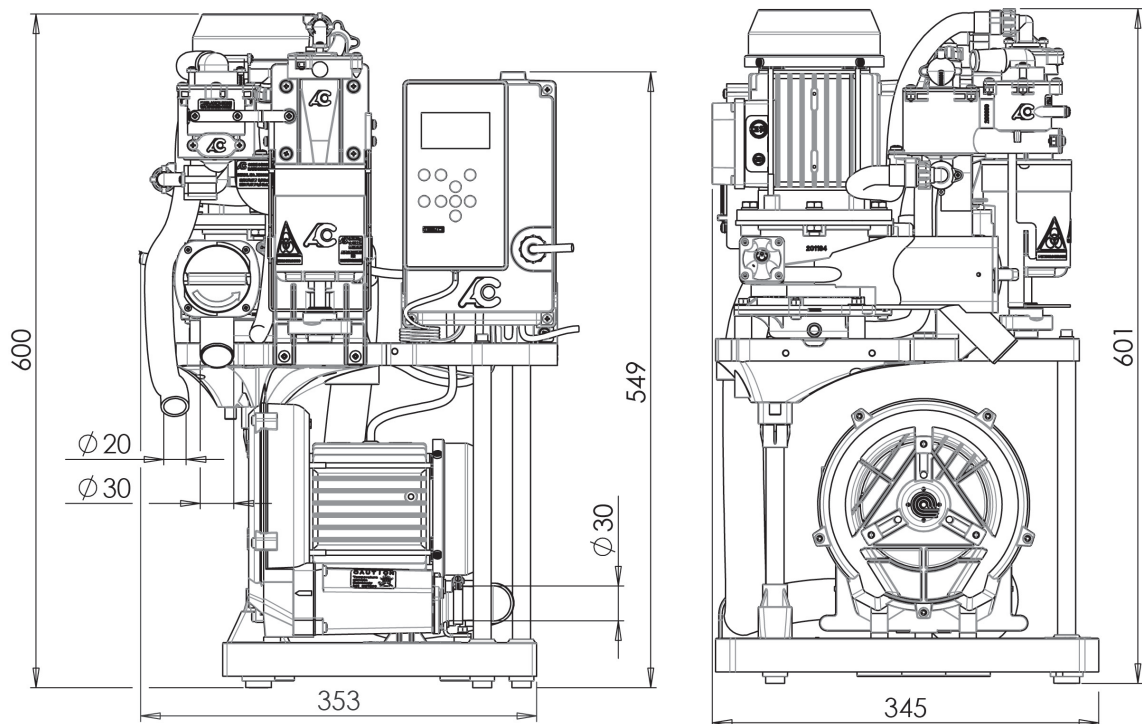


Fig. R

MICRO SMART CUBE DIMENSIONS

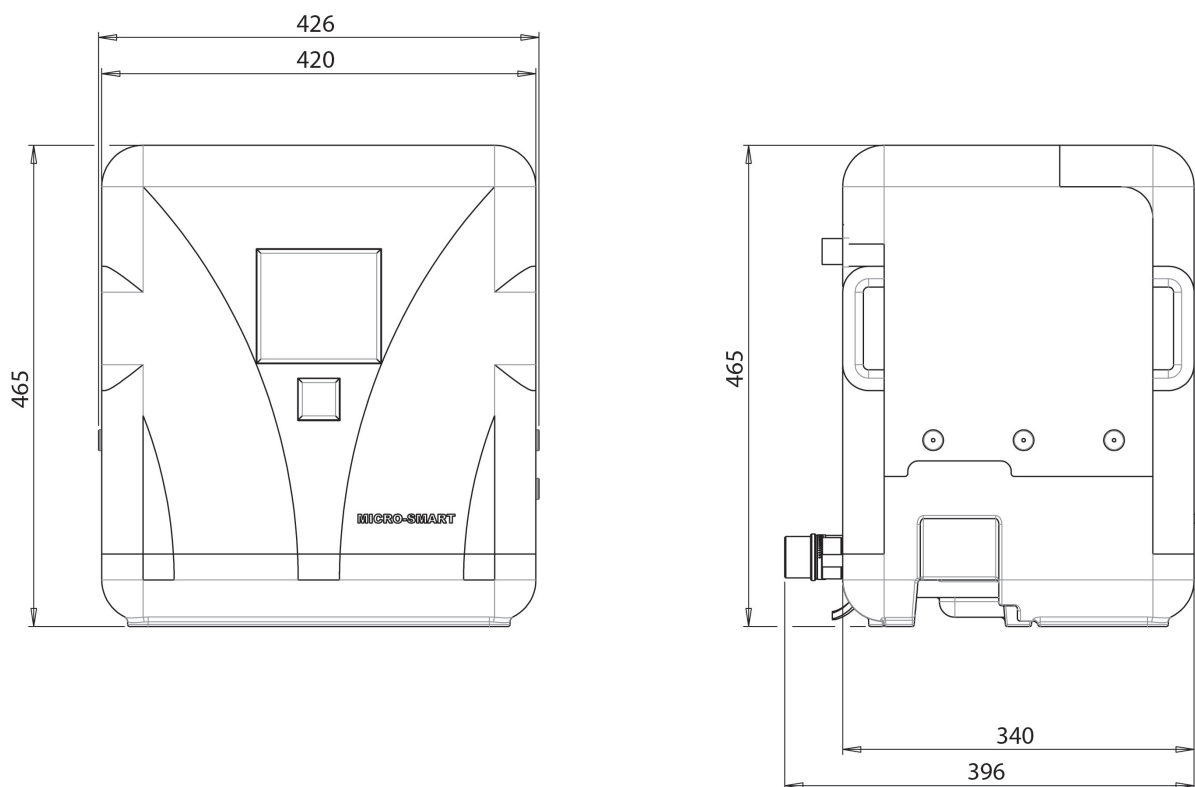


Fig. S

TURBO SMART DIMENSIONS

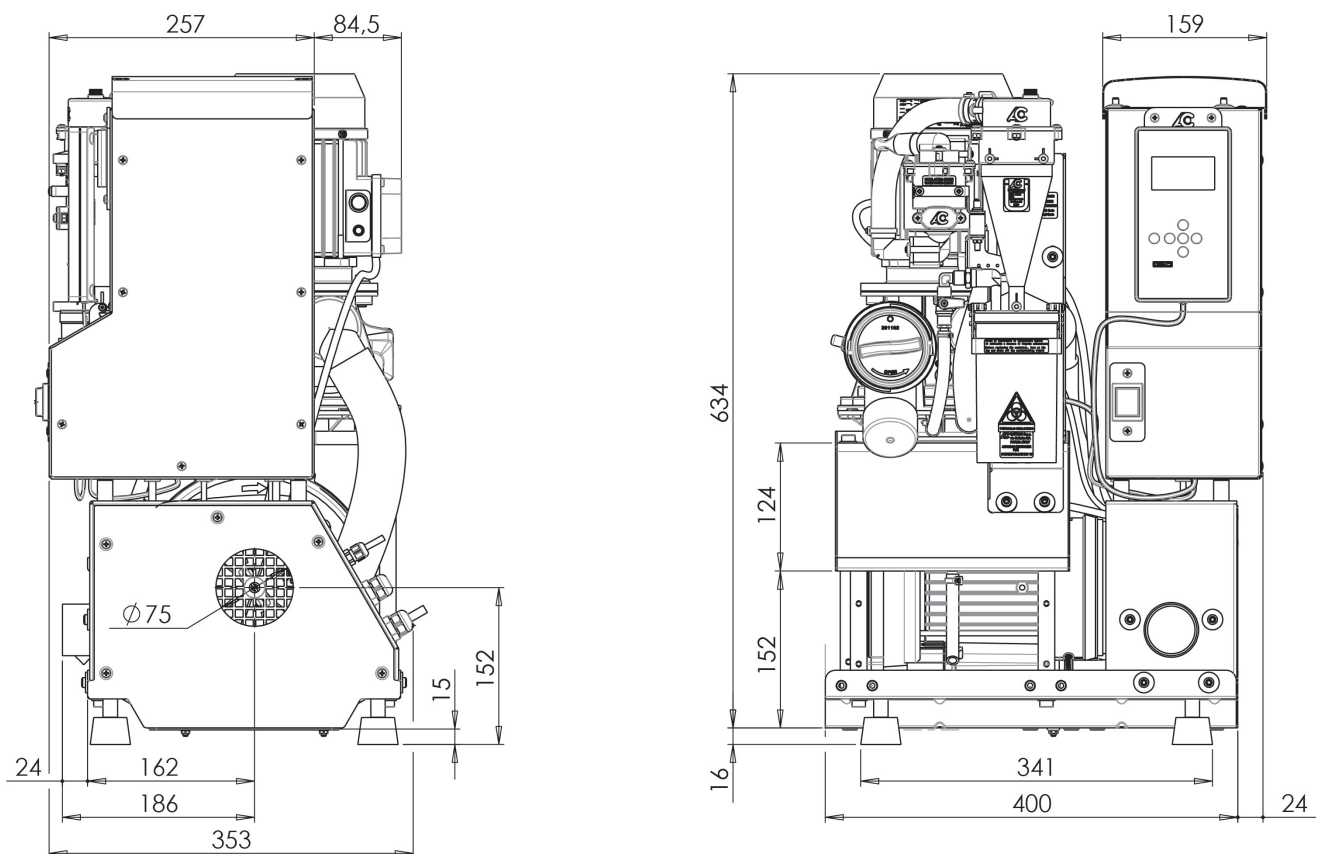


Fig. T

TURBO SMART TS DIMENSIONS

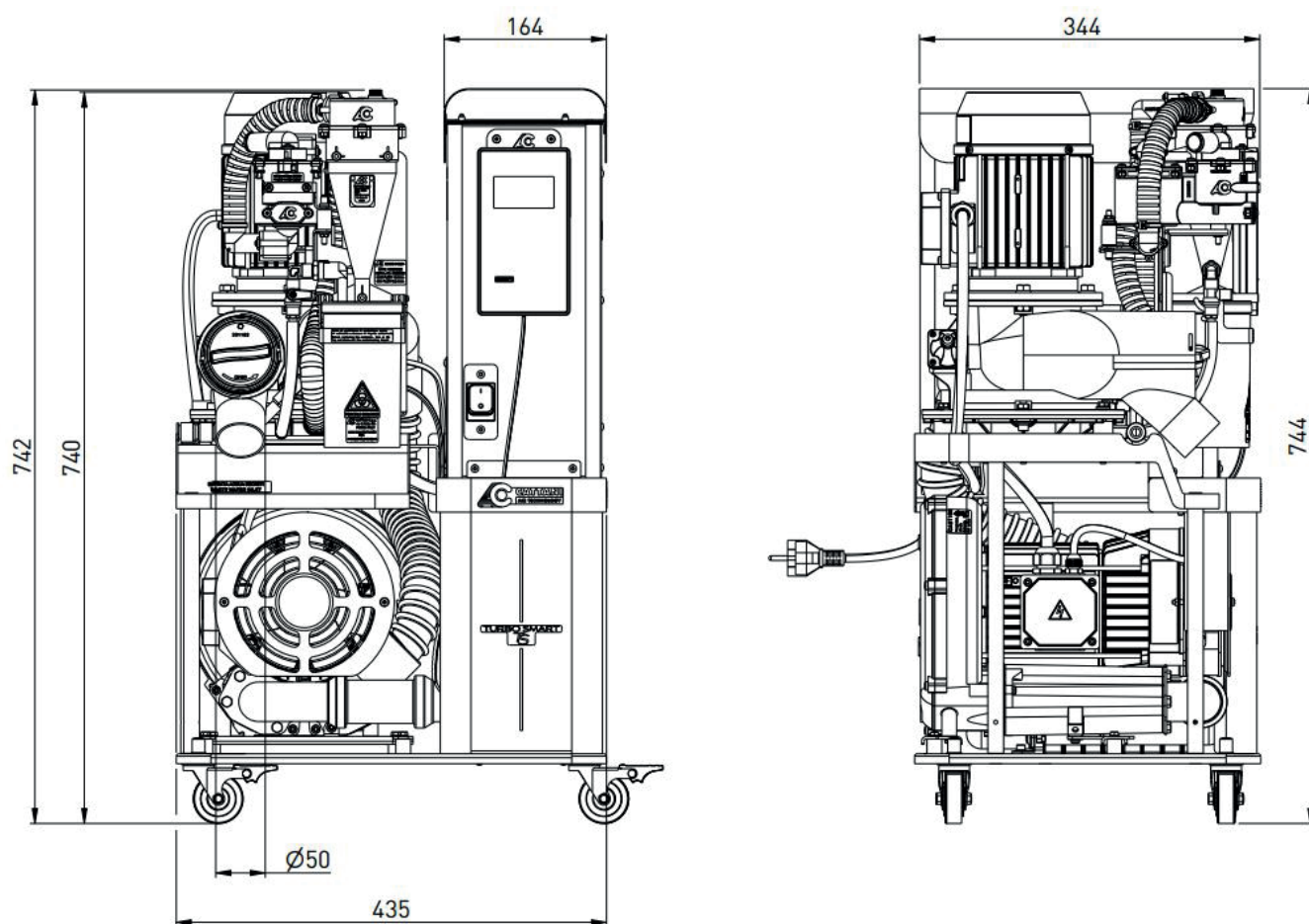


Fig. U

TURBO SMART 2V DIMENSIONS

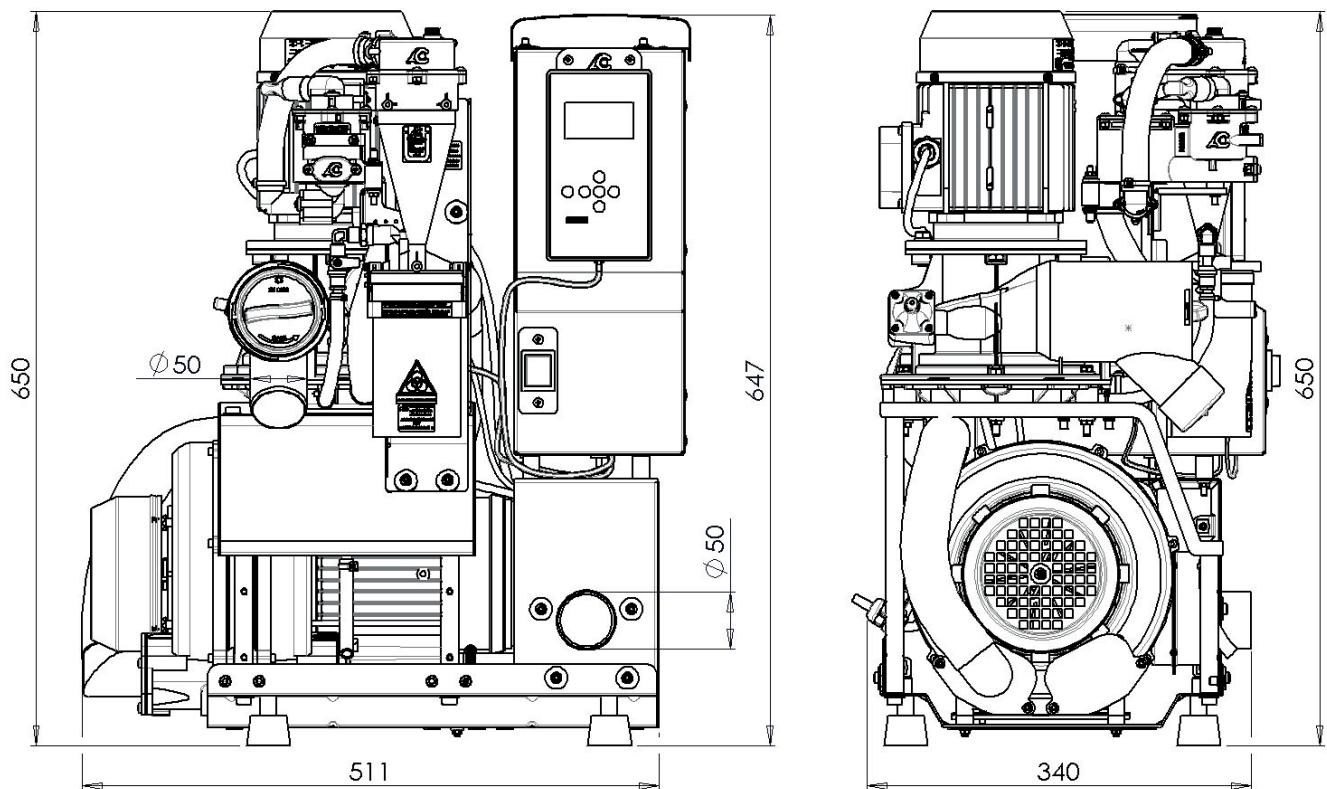


Fig. V

TURBO SMART CUBE DIMENSIONS

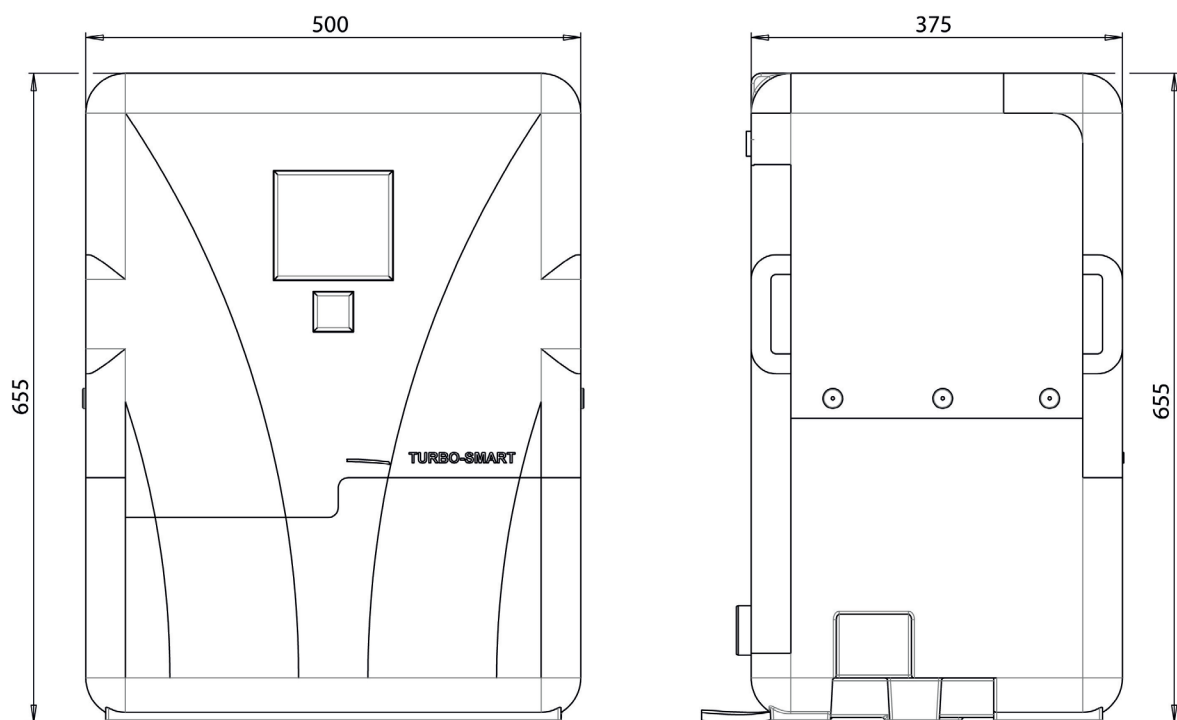
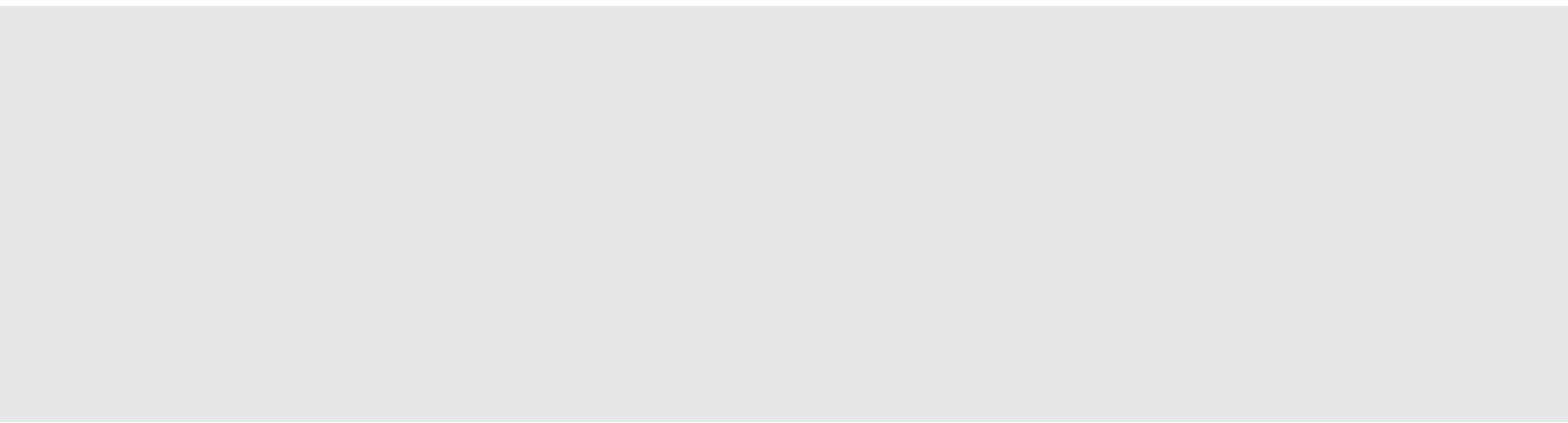


Fig. Z



**WE HAVE BEEN SPECIALISING WITH AIR TECHNOLOGY
FOR 50 YEARS:
SPECIALIZATION HAS GIVEN EXCELLENT RESULTS.**

Company with Quality System certified = **ISO 9001** = and = **ISO 13485** =

cod: ed. 04-2024

HOW IS IT WE LEAD IN OUR FIELD, WHEN WE COST LESS THAN THE ALTERNATIVES? THIS IS HOW:

Constant research: this enables us to apply the latest technology to all of our products and solutions.

We enhance performance: electronic and information technology enable us to enhance the performance and reliability of our products.

We reduce costs: less maintenance and lower energy costs mean that we are always the most economical on a cost-benefit analysis.

We reduce environmental impact: we save 50% on raw materials, and allow you to save between 30% and 50% on electrical consumption.