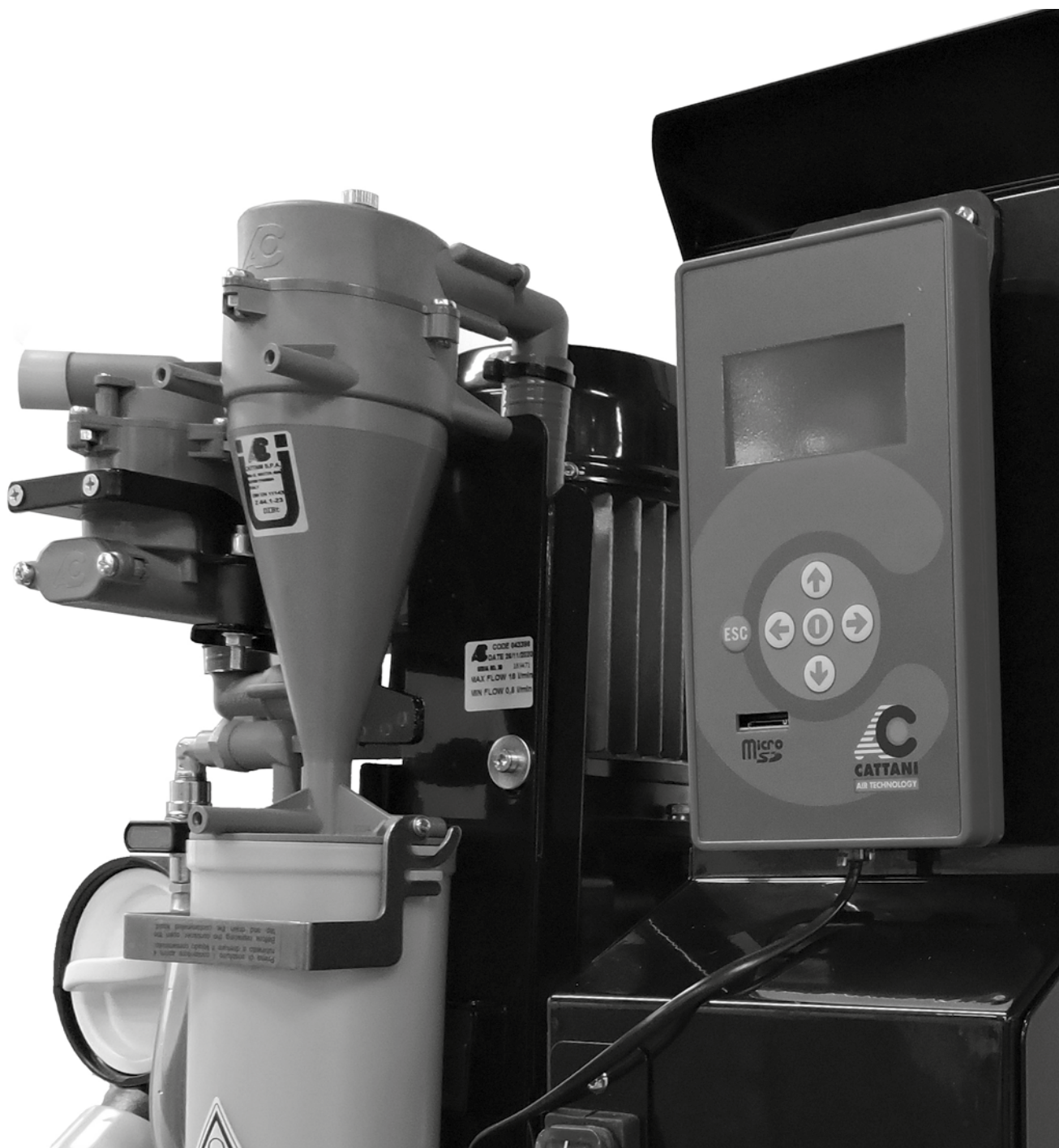




TURBO SMART HP

Instruction Manual

English



The original version of the instruction manual is in Italian.

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

CONTENTS

General operation data.....	4
Certification of medical devices in compliance with Regulation (EU) 2017/745 CLASS I	5
Introduction.....	6
Signals and warnings.....	6
Important notice on central aspirator certified as medical device.....	7
Installation and starting.....	8
Routine maintenance.....	14
Extraordinary maintenance.....	15
Instructions for adjusting some parameters in the menus of Smart aspirators.....	17
Instructions for configuration of WIFI (wireless) communication.....	26
Alarms description.....	29
Important warnings.....	30
Transport and storage.....	30
Transport of used systems.....	30
Waste disposal.....	31
Electromagnetic compatibility conformity levels according to EN 60601-1-2:2015 standard.....	32
Pictures.....	34

GENERAL OPERATION DATA 50/60 HZ

TURBO SMART HP SUCTION UNIT

Model	Turbo Smart HP
Nominal voltage	230 V ~
Nominal frequency	50/60 Hz
Absorbed power	13 A
Protection level against direct and indirect contacts	Class I
Method of use	Continuous operation
Protection against humidity	Standard
Maximum flow rate	1916 l/min
Max. vacuum with continuous operation	338 mbar
Maximum rotation speed	90 Hz
Sound pressure ver. without cover	70 dB(A)

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

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



Level of sound pressure detected per ISO 37461979 (E) standard.
Parameters: r= 1.5 - background noise: 34 dB(A) - Instrument: Brüel

& Kjaer type 2232.

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

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

Following the EC Declaration of Conformity for our devices classified as medical devices Class I: **Turbo Smart HP** Technicians authorised to carry out repair work on the abovementioned 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:

Componenti	Codice	
CONTROL PANEL	023724	Inverter control panel for Turbo Smart HP

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

The purpose of the following presentation is to illustrate the assembly and startup of Smart suction unit and to inform users about the dangers and the precautions to prevent them. This manual must be available for reference at all times during assembly, startup, operation and maintenance of your Turbo Smart HP suction.

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

This device is destined for professional use only, therefore it must be operated only by suitably trained, specialized personnel.

SIGNALS AND WARNINGS



Read the manual before you assemble the device.



Danger of electrical shock, even 230V ~ can be fatal.



Biological hazard: infections from epidemic diseases.



Generic danger sign.



Heavy-duty personal protection equipment



Personal protection equipment for biological hazard



High temperature.



No corrosive, flammable or explosive substances allowed in the room.



Forced direction of flow or rotation.

It is not always possible to describe hazards with signs, therefore users must read the warnings and comply with them.

Failure to comply with a sign or a danger warning may cause harm to the operator or to the patient.

Do not remove accident-prevention guards do not modify the machines or their operation.

Despite our best efforts, danger warnings may not be exhaustive; for that we apologize to the users, requesting that they arrange for any hazardous danger sources that we may have overlooked to be indicated and to kindly notify us.

IMPORTANT NOTICE ON CENTRAL ASPIRATOR CERTIFIED AS MEDICAL DEVICE

IMPORTANT NOTICE ON CENTRAL ASPIRATOR CERTIFIED AS MEDICAL DEVICE

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 device, check the outside of the packaging, check the Shockwatch impact indicator device, if it is red, or if the box is damaged, accept it, subject to inspection of the device.

To remove the machine from the box, follow the instructions printed on the outside of the packaging. The box can be recycled. Please dispose of it according to the regulations in force. Hold on to the stoppers of the device external/internal connectors, they can be used whenever the aspirator needs to be moved.

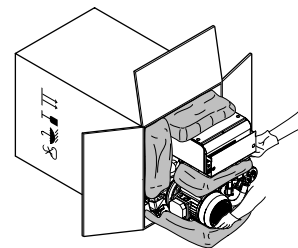
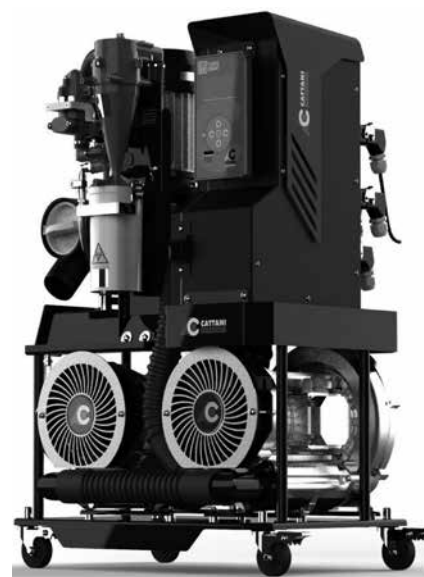
Installation of the device must be performed by a skilled person using suitable tools. The suction unit must be placed in a clean area, away from heat sources, humidity and dust.

Ambient temperature of the technical room must be below + 5°C and not above +35 °C.

Turbo Smart HP is a device for interiors and not intended for exterior installation.

If ventilation or air conditioning is needed in the plant room, the ventilation or air conditioning system should be designed by a thermal engineer. The plant room shall not be accessible to patients or the public. Should this facility not be available, the equipment must be protected by casing not easily removable.

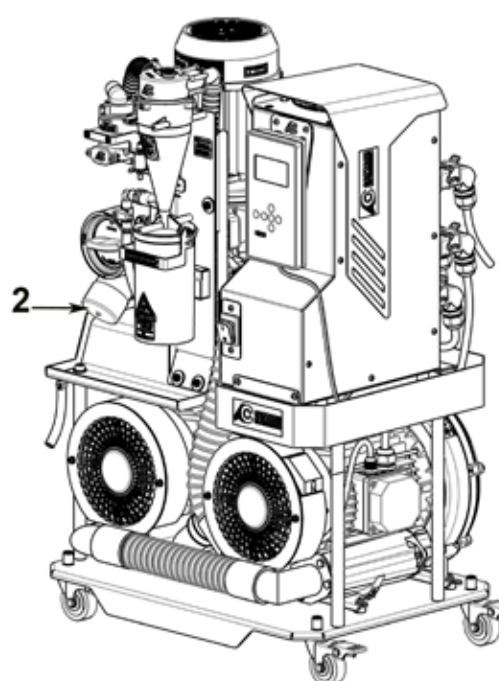
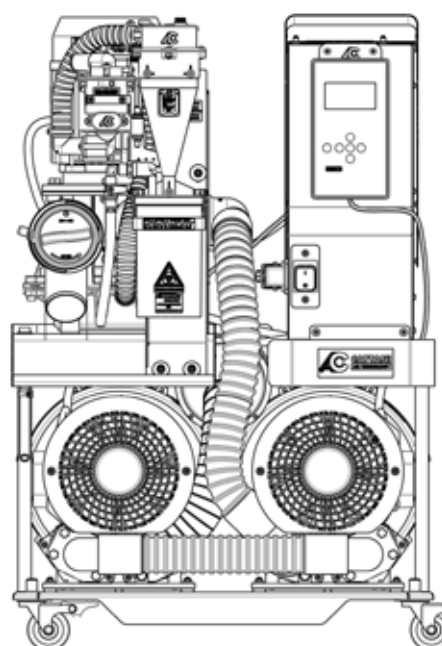
Put in place protections and danger signs in order to prevent accidental contact dangerous for electric shock and (in some rare but not impossible situation) for the possibility of fire, explosion due to leakage of contaminated liquids and air. No flammable material should be stored in the plant room; ensure that there is no possibility of gas leaks in the room. Caution: to avoid electric shock risk, this device must be connected only to supply network with Earthing protection.



ASSEMBLY

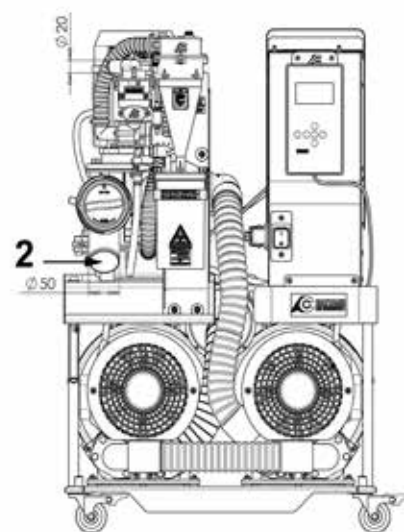
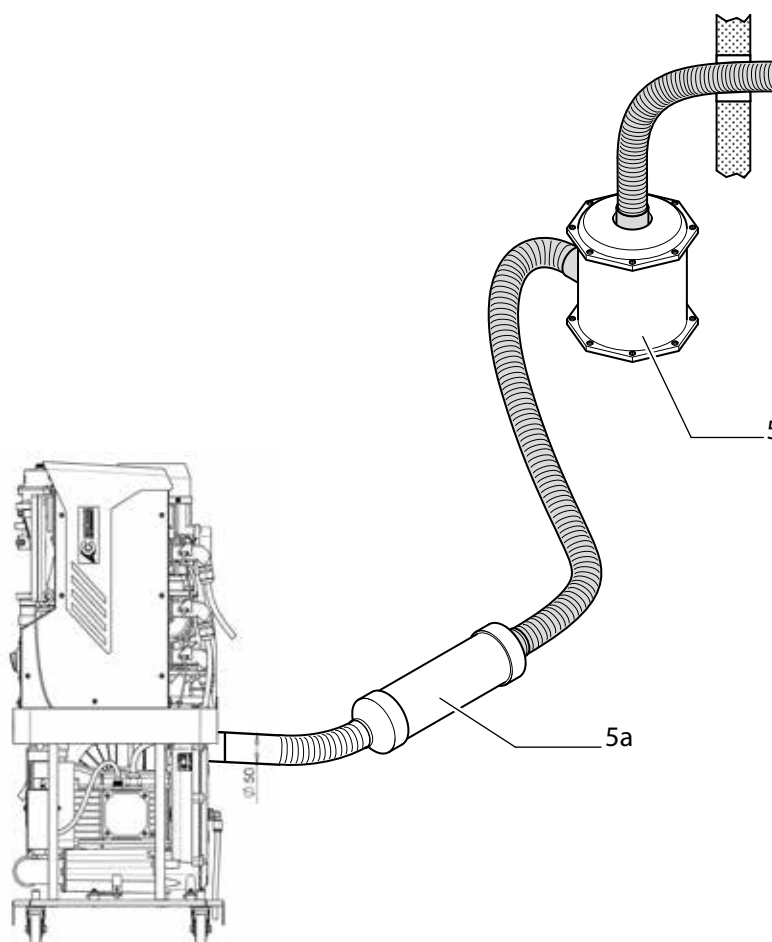
Before connecting the suction unit to the piping of the centralized system, ensure that the suction lines are clean, heavy particles can damage the device. The suction pipe (in PVC light grey colour provided with the device) must be connected to the 50 mm diameter “suctioned fluid inlet” tube holder **(2)**. On the opposite side, the same tube is connected to the suction piping incoming from the suction devices.

The exhaust air pipe (black, heat resistant with metal spiral) must be connected to the 50 mm diameter tube-holder “exhaust air outlet”, the other end of the tube shall be connected 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. The suctioned liquids shall drain from the 20 mm diameter tube holder, which is connected to the clinic’s liquid drainpipe. The liquids coming out of the hydrocyclone are drained by gravity, and in no way they can be discharged upwards. The tubes connecting the machine to the suction and draining system are flexible in order to dampen the small vibrations produced by the operation of the suction unit. The suction piping generally runs inside the floor and in the proximity of the suction unit, it rises for about 30 cm until it reaches the tube holder **(2)**.



Even for installations where the Smart suction units are setup at a floor below the clinic, the suction piping must reach the floor where the suction unit is located, run flat along the floor for a few metres then rise with a flexible tube up to the centrifugal separator (fig. B, page 34), the fluid enters the suction unit.

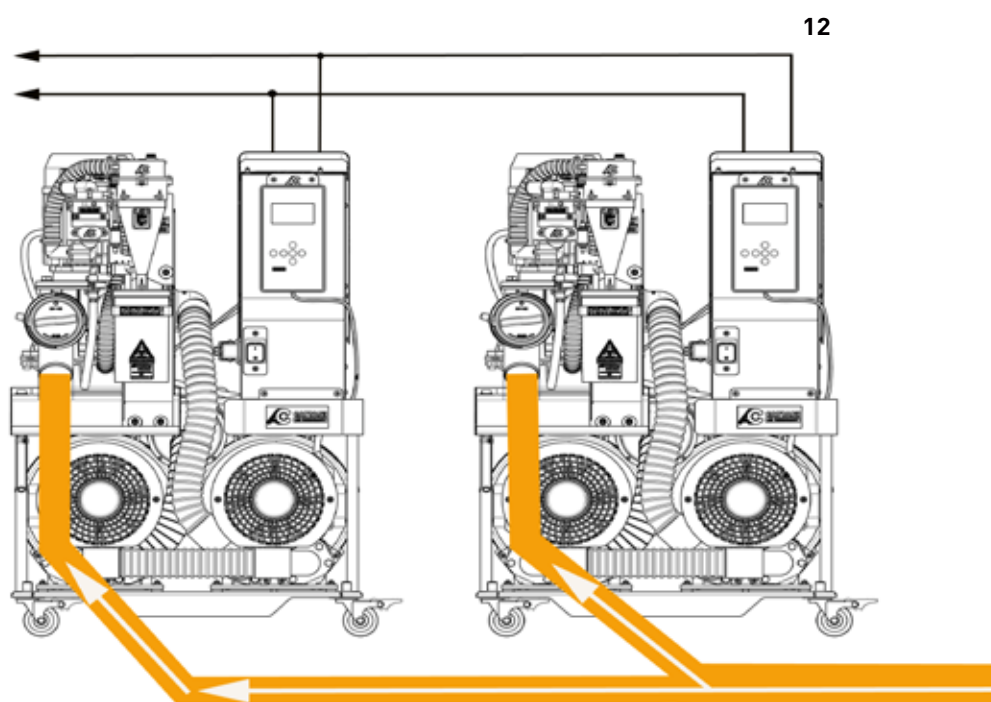
When assembly is completed, connect the power cable to the electricity supply line following regulations in force. Lastly, connect the low voltage permissive line to the dental units dry contacts (see wiring diagrams on page 35) Ensure that the contact is dry (not live).



PARALLEL INSTALLATION

It is advisable to install in parallel only identical machines, having the same flow rate and the same head. Two or three suction units in parallel* double or triple the flow rate, provided that the diameter of the main piping is increased of ten mm for each additional suction unit added. In the same manner, the diameter of the exhausted air piping must be increased. Turbo- Smart HP always includes all the accessories required for the installation in parallel, therefore check valves, additional boards or peripherals are not needed. Connected to the same main piping, the two or three suction units in parallel, shall be connected in parallel also to the permissive **(12)** incoming from the various dental units. While installing the suction units in parallel, make sure not to invert the cables of no. 1 clamps with no. 2 clamps. With suction units in parallel it can occur that one unit stops without the operators

noticing it. To address this issue, the control unit (see wiring diagram page 35) clamps (dry contacts) carry an alarm signal at remote distance. The Turbo- Smart HP units in parallel work better and offer greater energy saving, when they are active simultaneously, independently from the request. Shutting the power supply to one of the suction units does not result in energy and reduces the performance of the units still in operation.



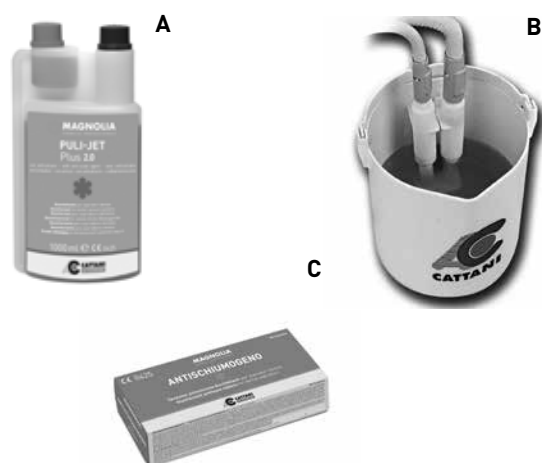
STARTING UP, TESTING AND INSTRUCTING PERSONNEL

Once the suction unit is installed and connected to the power supply, simply press the on/off button and close the suction contact (send the permissive signal) from one of the dental units connected to start the suction.

To verify the correct operation of the Smart suction, it is advisable to carry out dynamic type tests (shown on fig. D, page 36).

Training of the personnel on the device use and ordinary maintenance must be given on a new unit, not contaminated.

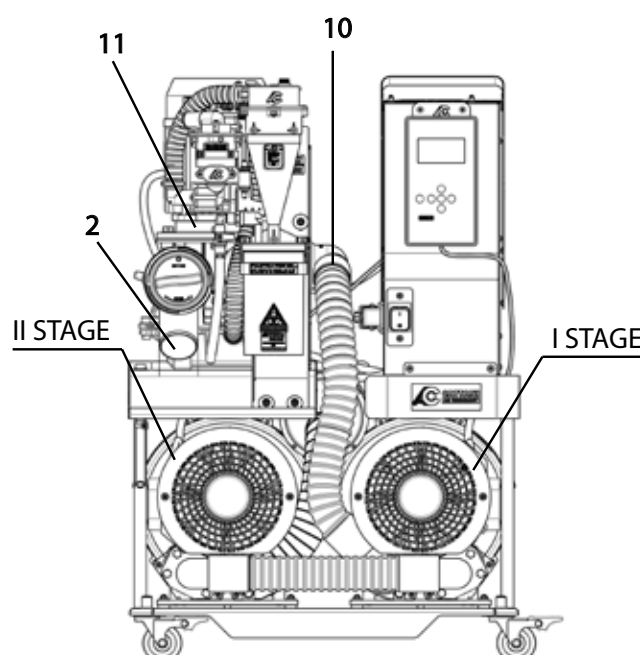
Dental clinic personnel must be trained on how to follow the stages of operation of the Smart suction unit on the display, on how to interpret danger warnings and on how to perform correctly maintenance operations with Puli-Jet plus 2.0 **(A)**, Pulse Cleaner **(B)** and antifoaming disinfectant tablets **(C)**.

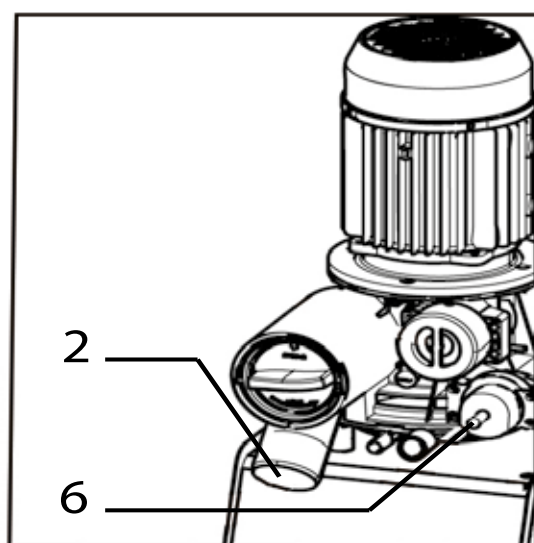


OPERATION

The suction assembly is made of two blowers in series (**STAGE I and STAGE II**) that through the tube **(10)** creates the vacuum in the centrifugal separator **(11)**. The fluid coming from the dental clinic, through the manifold tube **(2)** flows into the centrifugal separator **(11)**. The centrifugal separator divides air from liquids: the air is exhausted outside through high temperature tube, while the liquids (if there is no amalgam separator) are drained into the sewage through the drain tube connected to the tube holder **(6)**.

The centrifugal separator starts off (part. **11**) ahead of the turbines (**STAGE I and II**), this advantage allows to expel liquids that might have been accumulated in the centrifugal separator before suction begins. When the machine is switched off, an adjustable timer will keep the suction unit on for 10 to 300 seconds.





ISO AMALGAM SEPARATOR

The Turbo Smart HP can be ordered complete with the "Hydrocyclon ISO 18" amalgam separator. The amalgam separator always comes with the operation and maintenance manual.



ROUTINE MAINTENANCE

ROUTINE MAINTENANCE

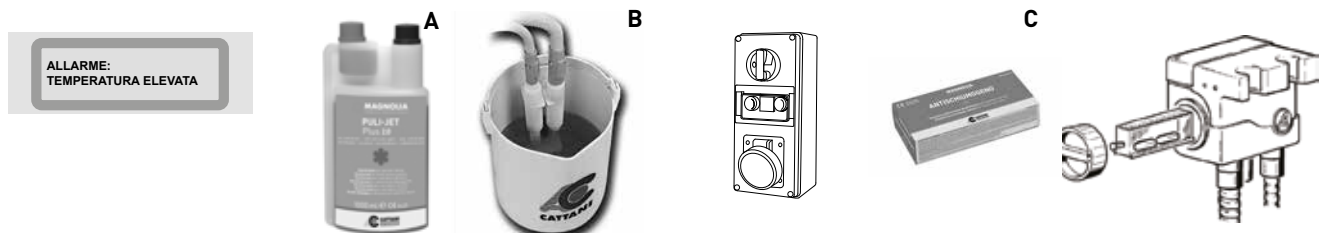
Ordinary maintenance to be carried out by trained members of the dental clinic.

- Please be aware of all hazard signs and protect yourself with glasses, gloves and disposable overalls.



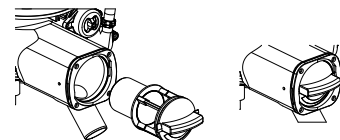
DAYLY

- Check the display for possible alarms, if danger warnings are present contact a technician.
- Every night, aspiration of Puli-Jet plus 2.0 disinfectant solution with antiscaling agent **(A)** using Pulse Cleaner **(B)**.
- **Before going near the suction unit remove the power.**
- Place the antifoaming disinfectant tablets in the filters of the dental units **(C)**.



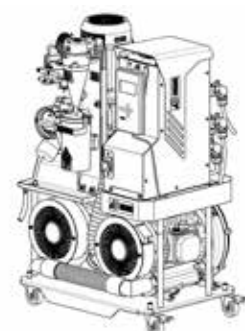
PERIODICALLY

- Keep the filter of the suction unit clean.



OCCASIONALLY

- Make sure that the free ventilation of the suction unit is not obstructed;
- Keep the plant room clear of material that is not related to the machines, in particular flammable material; ensure that there is no possibility of formation of corrosive, flammable or explosive mixes.



EXTRAORDINARY MAINTENANCE

EXTRAORDINARY MAINTENANCE

Extraordinary maintenance is to be carried out by a trained technician, using original spare parts:

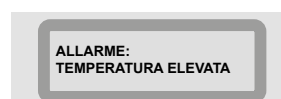
- Be aware of hazard signs and wear protective glasses, gloves and disposable overalls.
- Check maintenance condition, ensure that Magnolia products are being used.
- Before working on the machines, cleanse by washing with Puli-Jet plus 2.0 **(A)**, wait 15 minutes for the disinfectant to take effect. Disinfect the outside of the machine too.

If suction is not working, pour the disinfectant in manually, tilt the machine repeatedly so that the liquid can reach all contaminated parts.



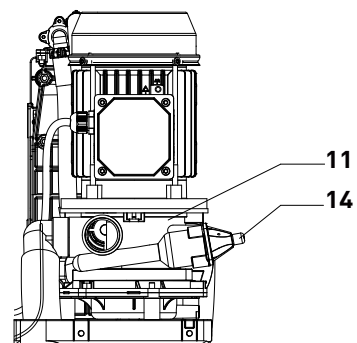
RECOMMENDED INSPECTIONS EVERY 12 MONTHS

- Check the maximum temperatures recorded and all the alarm signals, act accordingly.
- Check noise level of the suction unit, max. 72 dB in accordance with standard 3047(E).
- If the electronic components of the circuit needs cleaning, use with a jet of dry air with pressure not exceeding 2 bar. Use 6 bar pressure to clean the small holes in the front cover of the suction assembly **(15)**;
- Check the plastic tubes, especially those under pressure outfeeding from the centrifugal separator that connect the ISO hydrocyclone. We recommend they be replaced every 12-18 months.



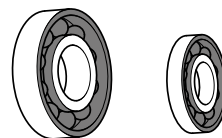
RECOMMENDED INSPECTIONS EVERY 18-24 MONTHS

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



RECOMMENDED INSPECTIONS EVERY 10,000 HOURS

- Rubber parts: O Rings, bellows, seals must be replaced every time a part that affects seal is disassembled.
- Replace motor bearings and vibration dampeners.
- If ordinary maintenance is inadequate or unsuitable products are used, instruct personnel and inform the person in charge in the dental clinic.



INSTRUCTIONS FOR ADJUSTING SOME PARAMETERS IN THE MENUS OF SMART ASPIRATORS

MAIN MENU



When the control unit is switched on, the graphic display shows the Cattani S.p.A. logo for 10 seconds, then the main menu appears.

MAIN MENU "A1"



The display shows parameters such as operating frequency, time for suction unit activation, temperature, amalgam container (if any) and system software version. Press the right arrow  to access Menu A2.

CONTROL MENU "A2"



This menu shows: number of times the machine was switched on, total switched-on hours, number of suction unit activations, actual hours of suction unit use, operation hours in relation to frequency and number of fan activations.

Right arrow 

EVENT MENU "A3"



This menu lists the last events or alarms occurred. Events are identified by a number, see table on page 29 for a list.

Right arrow 

WI-FI SCAN MENU "A4"



Here you can scan available Wi-Fi networks.

CONTROL MENU "A2"

Counters – Odom . A2

Power Cycles	00000	Number of switch-on from master switch
Uptime [h]	00000	Total switch-on hours (with motors off)
Work Cycles	00000	Number of activations by suction control
Work Time [h]	00000	Actual operation hours (motors on)
Aspirator [h]	00000	Hours operation in relation to frequency
Fan Cycles	00000	Number of activations of control unit cooling fan

SECONDARY MENUS



Press to access the secondary menus

From this menu, press the down arrow to access the following .

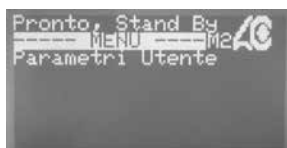


DRIVE STATUS



This menu can be accessed without Password; here you can read useful information on operation.

USER PARAMETERS



To access, enter the password "0000123000".

This allows you to change vacuum level, language, read the Code Generated and access the Activation menu.

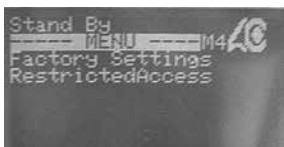
SYSTEM PARAMETERS SETUP



To access, enter the password "0000456000".

This is where you can adjust switch-off delay and other technical parameters.

FACTORY SETTINGS RESTRICTED ACCESS



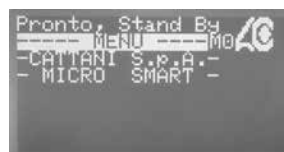
This menu is not accessible, exclusively reserved to Cattani company.

WI FI SETTINGS



This menu can be accessed without a password and it is used to configure the Wi-Fi parameters.

KEYING IN AND ENTERING THE PASSWORD



Drive Status is the only menu that can be viewed without a Password.

A password is required to access the User Parameters and System Parameters Setup menus.

The password for the "User Parameters" menu is "0000123000".

The password for the "System Parameters Setup" menu is "0000456000".



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



Press Enter , the cursor will appear on 0, to the right.

Press  and move the cursor to the sixth 0.

By pressing  1 will appear.

Press  move to the 0 next to it and with  select 2.

Press  move to the 0 next to it and with  select 3.



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

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

Now you can change the parameters of the "User Parameters" menu.

Repeat the same procedure to enter the password 0000456000 and access the changes of the "System Parameters Setup" menu.

"INVERTER STATUS" MENU

This menu is visible without entering a password. Its function is to display suction unit status parameters, some of which are listed below.



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 temperature detected (can be reset with code 19404 in menu drive commands)

```

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

-- SUB MENU -- S8
Massima Temperat
Assoluta 36.2°C

```

Maximum detected temperature

```

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

-- SUB MENU -- S9
Tensione Bus
Potenza 309 V

```

Bus voltage

```

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

-- SUB MENU -- S10
Massima Tensione
BUS Memoriz. 323V

```

Maximum bus voltage recorded

```

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

-- SUB MENU -- S11
Ripple Bus
Potenza 000 V

```

Ripple bus voltage



Instantaneous vacuum level



Run mode (describes how the machine must operate)

"USER PARAMETERS" MENU



To access this menu, enter Access Password 0000123000 (see instructions on page 19).



Vacuum set point - Vacuum level-
Shows maximum vacuum level set.

Press Enter to change, use the arrows to set the desired value.

Press Enter to confirm change



Language

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

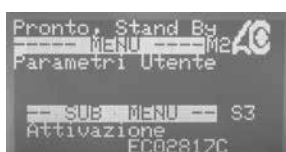
Press Enter and using the arrows select 0 or 1 or 2 or 3 or 4 or 5.

Press Enter to confirm change



Generated code

This code is generated by Cattani S.p.A.. Each machine has a unique code.



Activation code - if any

"SYSTEM PARAMETERS SETUP" MENU



To access this menu, enter Access Password 0000456000 (see instructions on page 19).

Now you can change some of the settings.

To change the parameters in this menu:

Scroll the menu with the arrows to highlight the parameters you want to change.

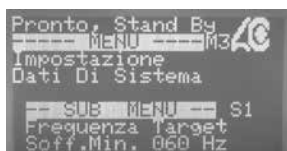
Press Enter to activate the cursor, use the arrows to set the desired value

Press Enter to confirm change

All the parameters can be adjusted:



Minimum vacuum level (not active)



Maximum blower frequency for the minimum vacuum level (not active)



Blower current limit for the minimum vacuum level (not active)



Medium vacuum level (not active)



Maximum blower frequency for the medium vacuum level (not active)

```

Pronto, Stand By
----- MENU ----- M3
Impostazione
Dati Di Sistema
-- SUB MENU -- S5
Limite Corrente
Soffiante 025A

```

Blower current limit for the medium vacuum level (not active)

```

Pronto, Stand By
----- MENU ----- M3
Impostazione
Dati Di Sistema
-- SUB MENU -- S6
Setpoint Vuoto
Chirurg. 210mBar

```

Surgical vacuum level (not active)

```

Pronto, Stand By
----- MENU ----- M3
Impostazione
Dati Di Sistema
-- SUB MENU -- S7
Frequenza Target
Chirurgica 100 Hz

```

Maximum blower frequency for surgical vacuum level (not active)

```

Pronto, Stand By
----- MENU ----- M3
Impostazione
Dati Di Sistema
-- SUB MENU -- S8
Limite Corrente
Soff. Chir. 035A

```

Blower current limit for surgical vacuum level (not active)

```

Pronto, Stand By
----- MENU ----- M3
Impostazione
Dati Di Sistema
-- SUB MENU -- S9
Ritardo
Spegnim. 010s

```

Switch-off delay (max. 300 S)

```

Pronto, Stand By
----- MENU ----- M3
Impostazione
Dati Di Sistema
-- SUB MENU -- S10
Ritardo Spegnim.
Pompa 05000s

```

Pump switch-off delay (max. 7200 S)

```

Pronto, Stand By
----- MENU ----- M3
Impostazione
Dati Di Sistema
-- SUB MENU -- S11
Ritardo Spegnim.
Ventola 0300s

```

Fan switch-off delay (max. 150 S)



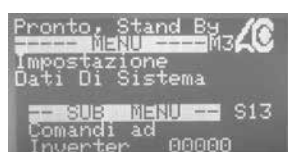
Pronto, Stand By
----- MENU ----- M3 AC
Impostazione
Dati Di Sistema
-- SUB MENU -- S12
Opzioni
Utilizzate 00000

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

Commands to inverter.

Reserved for factory settings

INSTRUCTIONS FOR CONFIGURATION OF WIFI (WIRELESS) COMMUNICATION



Turbo Smart HP can be controlled by the professional user through the **SmartApp**.

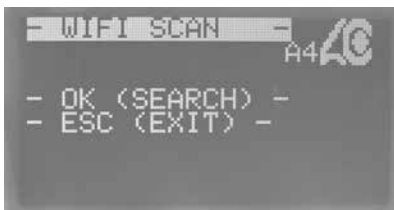
SETTING UP THE CONNECTION AND COMMUNICATION IN THE ASPIRATOR



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

Menu "A1"

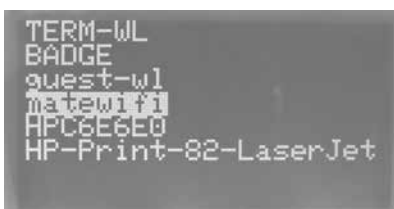
WI-FI OFF



Press  towards Menu "A4" WI-FI SCAN



Press  and wait for network searching to be carried out.



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. 



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. 



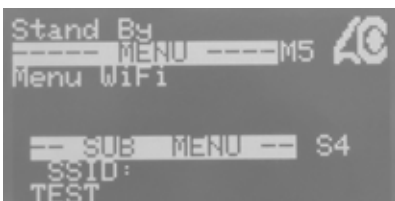
In the M0 menu, use the arrows,   to scroll down to the WI-FI M5 menu.



To access the Menu press .



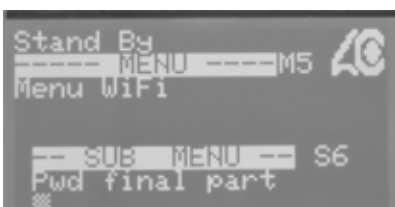
The WI-FI menu now shows (in S0) the non-changing IP address (IP dynamic).



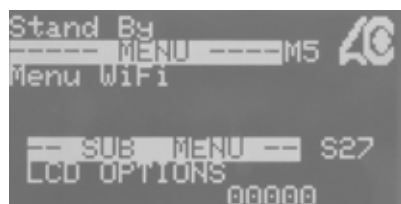
In the WI-FI menu you can check the network selected in SSID M5 S4.



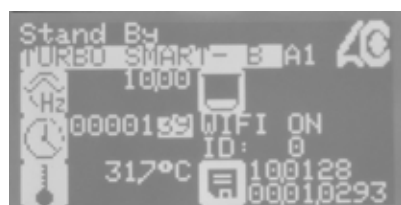
In Menu M5-S5, you can enter the password for the WI-FI router, using the arrows.



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.



ALARMS DESCRIPTION

Alarm codes		Description	Solution
00	0	Microcontroller memory alarm	Contact technician
I00	32	Microcontroller memory alarm	Contact technician
I01	33	Short circuit caused by one of the two motors	Check cause of short circuit and remove it
I02	34	Short circuit before motor control	Contact the technician (board probably damaged)
I03	35	Failed capacitor charging	Contact technician (replace the board)
I04	36	Temperature threshold exceeded	Ventilate plant room
I05	37	Blower current limit exceeded	Check efficiency of blower (shutdown or excessive resistance)
I07	39	Maximum voltage on capacitors exceeded	Check mains voltage max. 260V
S08	40	Centrifuge short circuit	Remove short circuit
S09	41	Short circuit of card in centrifuge outlet	Replace the board
S10	42	Instantaneous centrifuge current limit exceeded	Eliminate siphons in pipes or check efficiency of the centrifuge (shutdown or excessive resistance)
S11	43	Delayed centrifuge current limit exceeded	Eliminate siphons in pipes or check efficiency of centrifuge (shutdown or excessive resistance)
I13	45	Amalgam reader disconnected	Connect amalgam sensor
I14	46	95% of amalgam level exceeded	Replace amalgam container asap
I15	47	100% of amalgam level exceeded	Replace amalgam container
I16	48	Vacuum sensor tube disconnected	Connect vacuum tube to centrifuge
I17	49	Open thermal pad (Centr. Sep.)	Restore temperature in plant room
I22		Aspirator thermal switch open (Blower)	Ventilate the room

IMPORTANT WARNINGS

TRANSPORT AND STORAGE

TRANSPORT OF USED SYSTEMS

IMPORTANT WARNINGS

- The machines are guaranteed for one year from the date of sale, on condition that the warranty card's voucher indicating the date of sale, the seller and the customer user be returned to the manufacturer.
- The warranty and manufacturer's liability shall cease to apply if the equipment is serviced with unsuitable products or products other than those indicated by the manufacturer, used incorrectly or if the equipment is tampered with in any way by persons not authorized by the manufacturer.
- The manufacturer, the dealers, the representatives and the authorized technicians are available for advice, recommendations and to provide manuals, spare parts and whatever is needed.
- The manufacturer may decide to introduce changes in the products without notice due to technical needs, product improvement programmes, regulatory or functional problems, difficulty in sourcing parts or semi-finished products.
- At the **www.cattani.it** website you can find our latest **updated** manuals. We recommend you refer to these especially for the latest **safety** updates.
- Smart systems are AEE equipment, thus subject to WEEE (Waste Electrical and Electronic Equipment Directive) regulations.

TRANSPORT AND STORAGE

- During transport and storage, the packaged equipment can withstand temperatures ranging from -10 °C to + 60 °C.
- The packages should not be exposed to water and Sprays and cannot be withstand humidity above 70%.
- Three layers of boxes can be stacked over it, provided they have the same weight.

TRANSPORT OF USED SYSTEMS

- Before packing, we recommend you clean and disinfect the suction unit with Puli-Jet plus 2.0 (see chapters on "Signs and warnings" and "Regular maintenance").
- Drain all tubes and outside/inside communications as liquid residues (even disinfectant) could damage the control unit. Remove the amalgam retention vessel, add the disinfectant, close the vessel sealed. Dry the suction unit inside and outside, close all outside/inside communications with the stoppers provided, install a new amalgam retention vessel, wrap the suction unit and the control unit separately, to ensure maximum water tightness.
- Place the equipment inside a polyethylene bag and pack with triple-wave cardboard.

WASTE DISPOSAL

INFORMATION FOR PROFESSIONAL USERS

- Pursuant to art 13 law decree no.151 of 25 July, No. 151 "Implementation of directive 2011/65 UE ROHS and 2003/108/CE on restrictions on the use of hazardous substances in electrical and electronic equipment, as well as disposal of waste".

The crossed out trash bin icon displayed on the device, means that at the end of its life this product must be disposed using separate waste collection methods. Separate waste collection of this equipment at the end of its life is organized and managed by the manufacturer. When the users need to dispose of this equipment, they shall contact the manufacturer and follow the system that the manufacturer has adopted to enable separate collection of the equipment after its useful life.

Suitable separate collection to start the process of sending the discarded device towards recycling,

environment-friendly compatible disposal, contributes to prevent possible negative effects on the environment and on health and favours the reuse and/or recycling of the materials with which the equipment is made. Illegal product disposal on the part of the user shall result on the application of the administrative penalties envisaged 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:

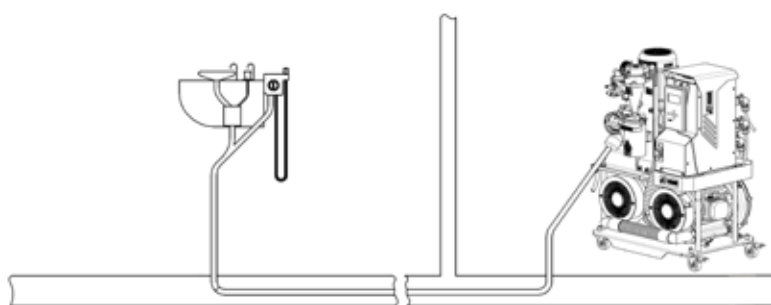
(1) For 80 MHz and 800 MHz the highest frequency interval is applied.

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

ASSEMBLY SCHEME

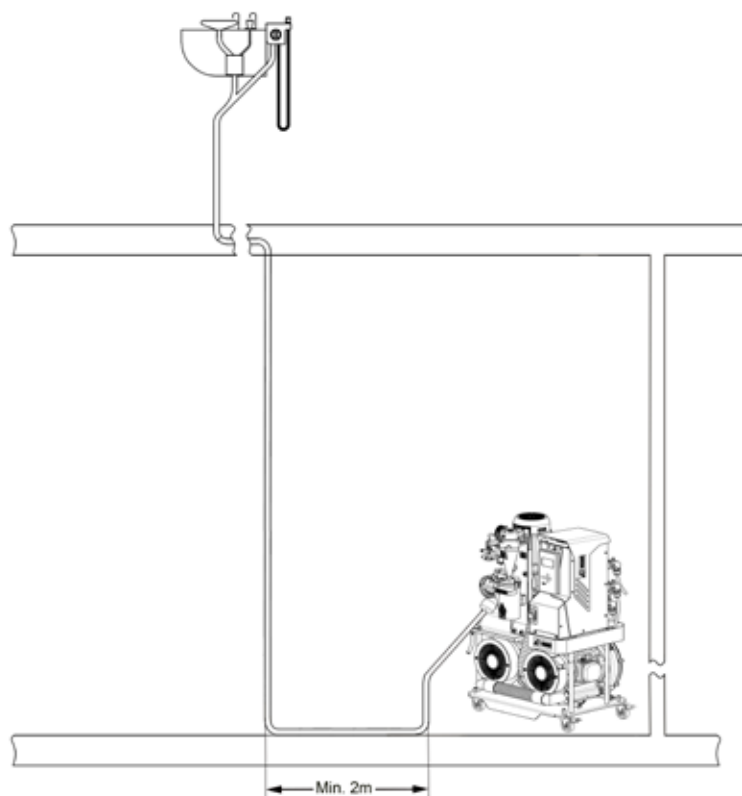
SAME LEVEL INSTALLATION

Fig. A



LEVEL BELOW INSTALLATION

Fig. B



ELECTRICAL CONNECTIONS

TURBO SMART HP CIRCUIT

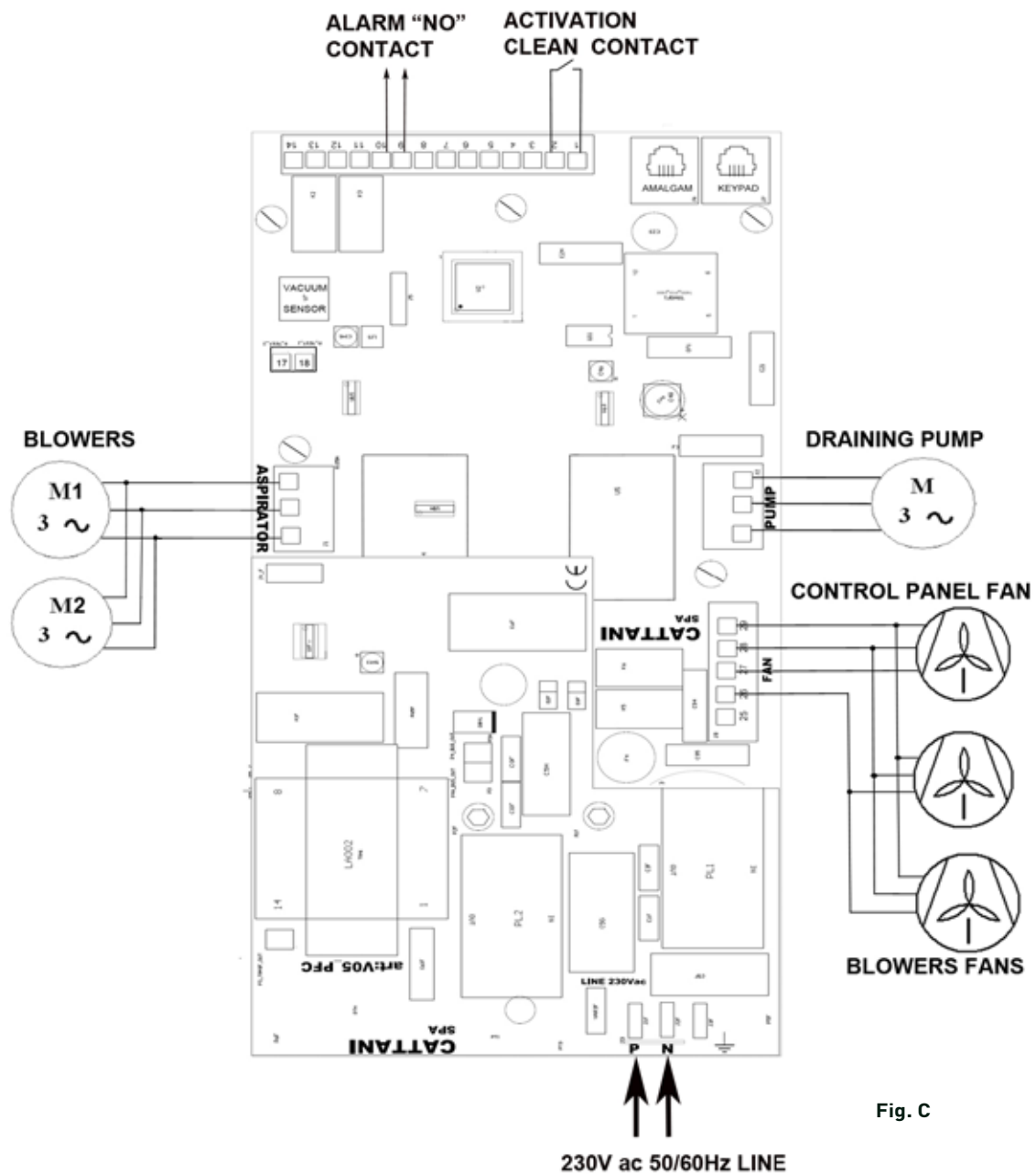


Fig. C

TURBO SMART HP DIAGNOSTIC TEST

To verify the correct operation of a variable frequency suction unit, some dynamic type tests can be carried out, such as the following.

With the machine switched on and suction inlet not connected to the piping. The other test shall be carried out with the suction inlet closed.

Fig. D

Frequency reached [Hz]	Head reached [mbar]	I blowers current [A]	I centrifugal separator [A]	I input line current [A]	Condition
85 - 90	70 - 80	7,5 - 8	1,3 - 1,5	9,5 - 10	Suction inlet open
48 - 52	330 - 338	8,5 - 8,8	1,3 - 1,5	7 - 7,5	Suction inlet closed

EXAMPLES OF PIPING

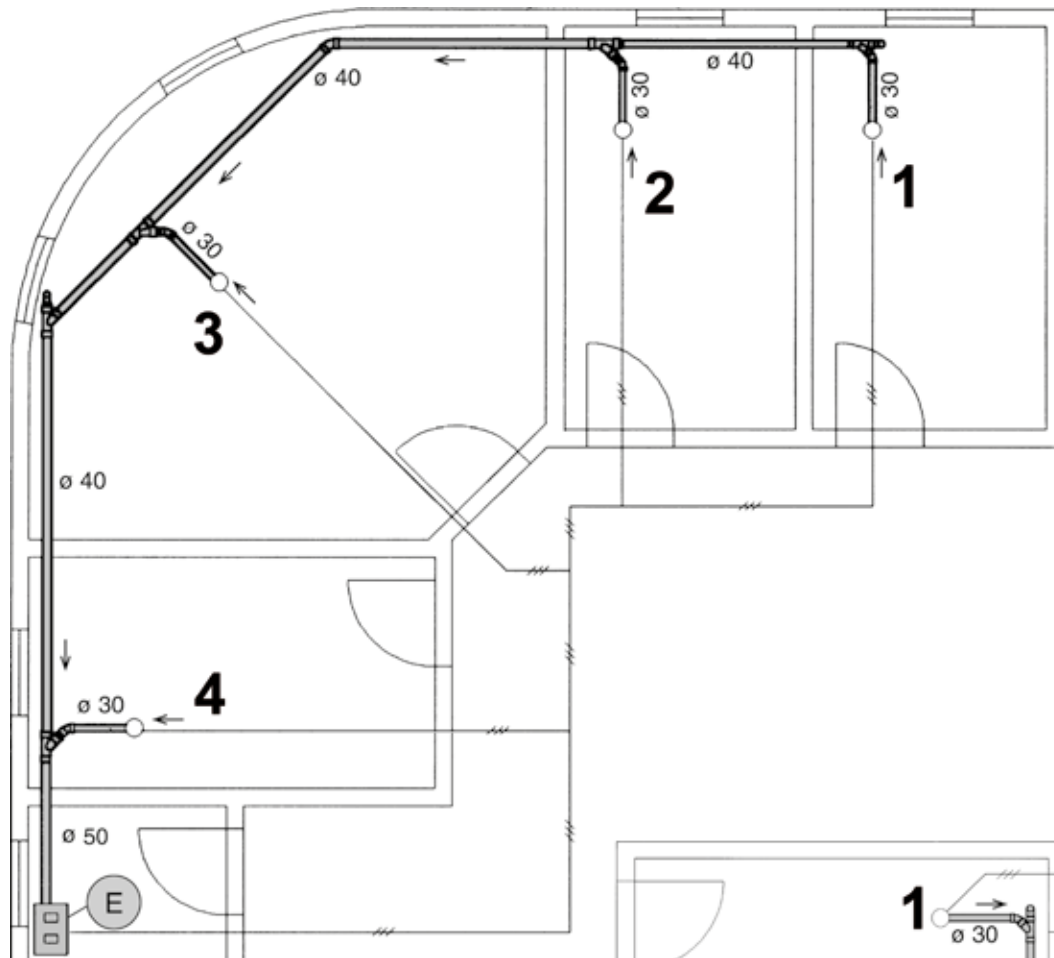


Fig. E

E = Turbo Smart HP

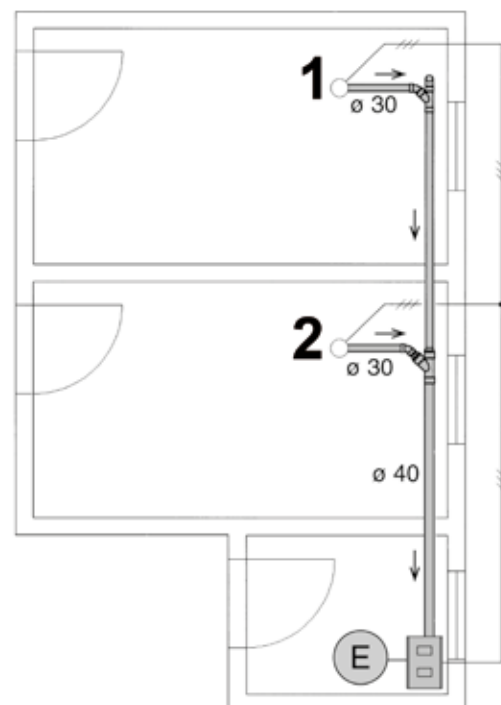


Fig. F

TURBO SMART HP EXPLODED VIEW

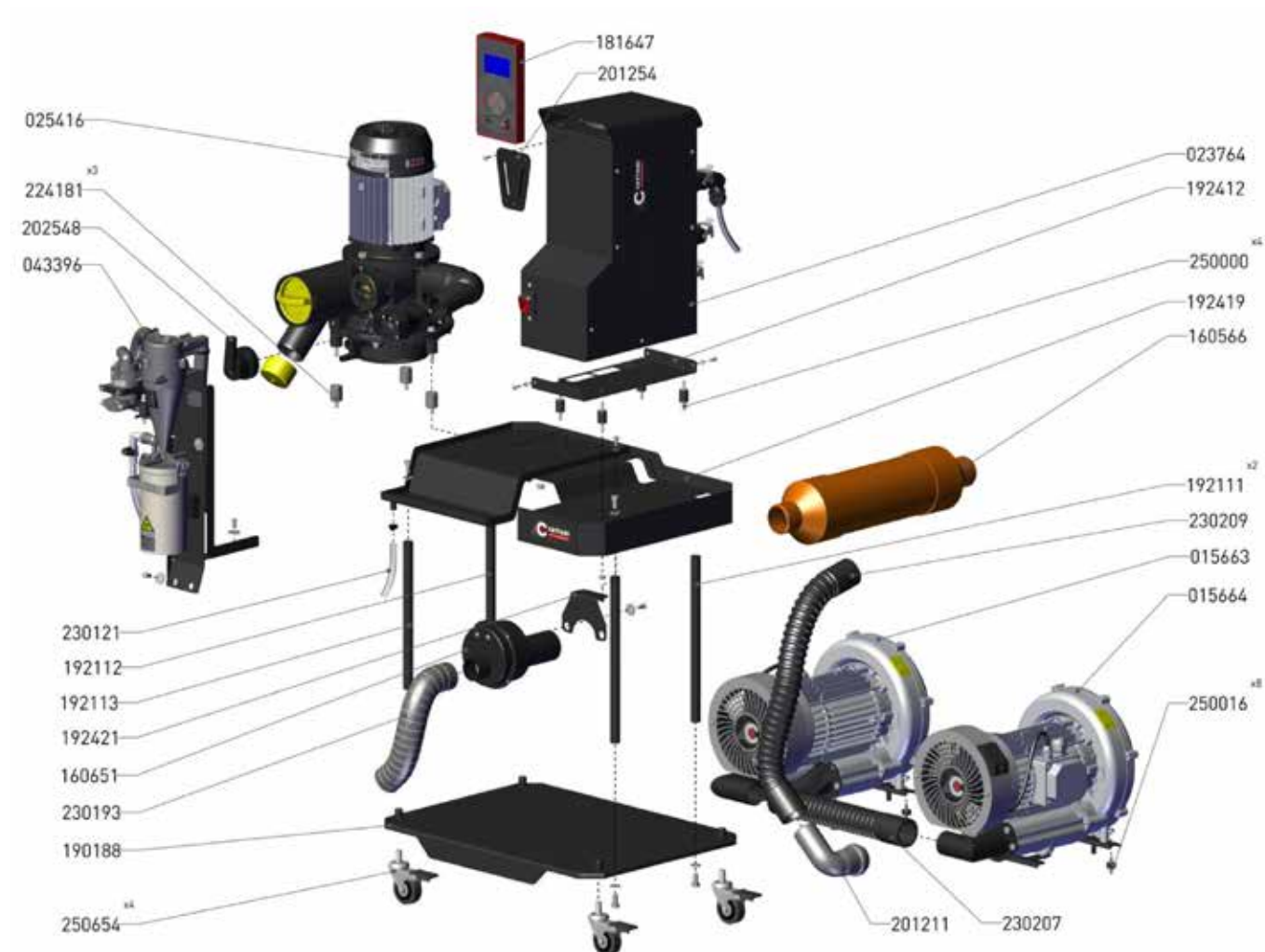


Fig. G

CENTRIFUGAL SEPARATOR 023764

EXPLODED VIEW

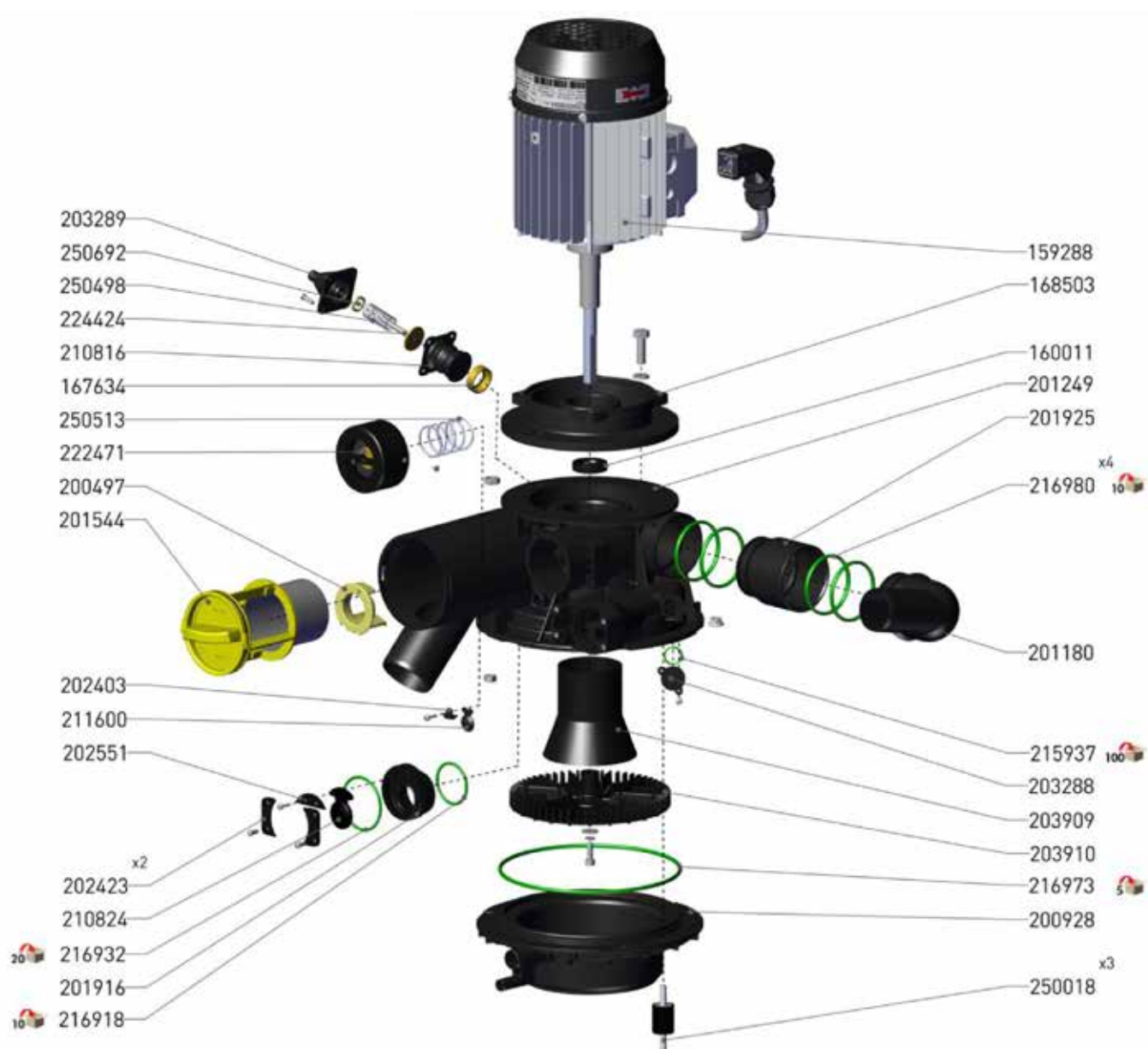


Fig. H

UNI-JET 75 (SX) 015663 EXPLODED VIEW

UNI-JET 75 PER TURBO-SMART HP (SX)
UNI-JET 75 FOR TURBO-SMART HP (L)

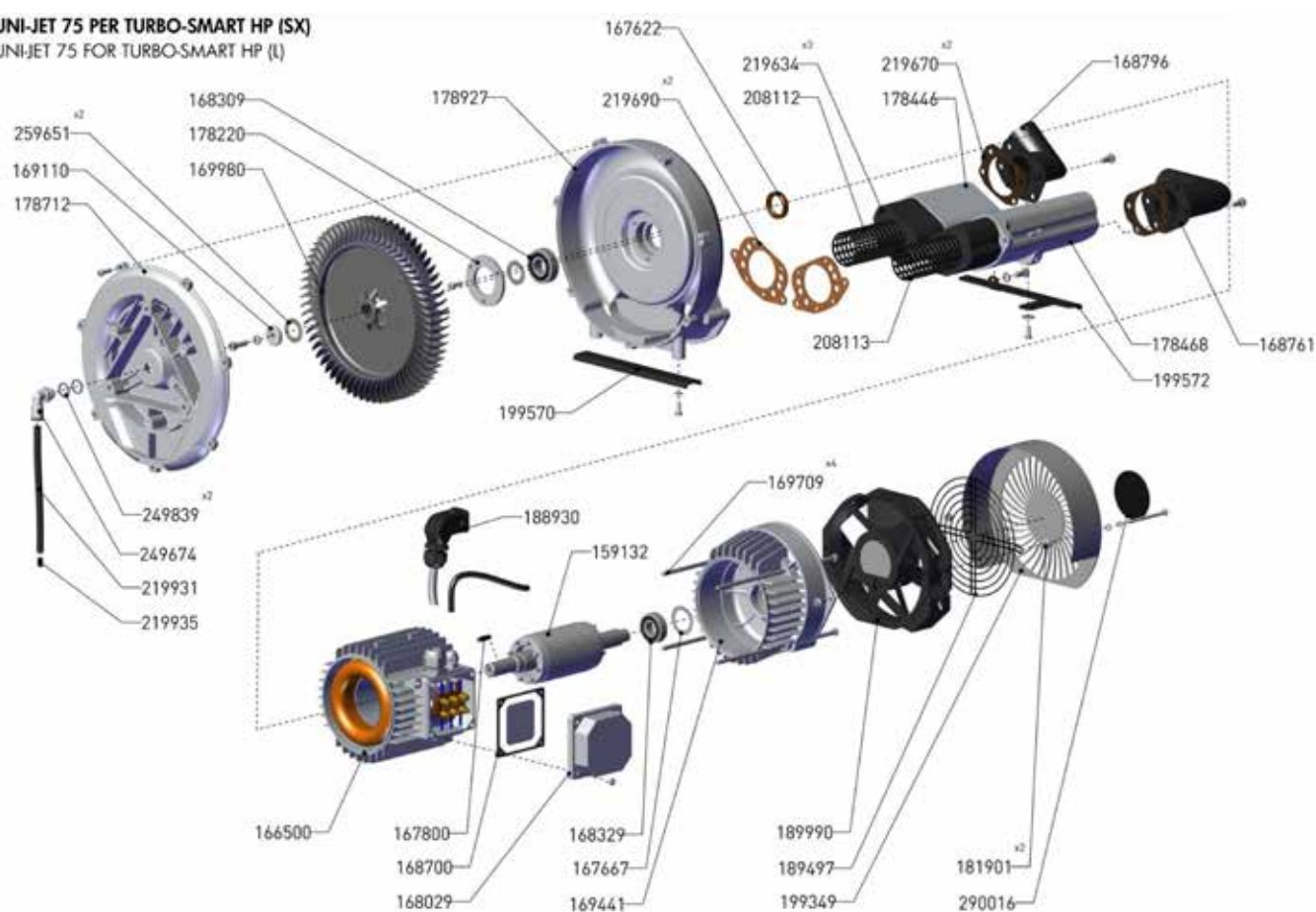


Fig. I

UNI-JET 75 (DX) 015664 EXPLODED VIEW

UNI-JET 75 PER TURBO-SMAT HP (DX)
UNI-JET 75 FOR TURBO-SMAT HP (R)

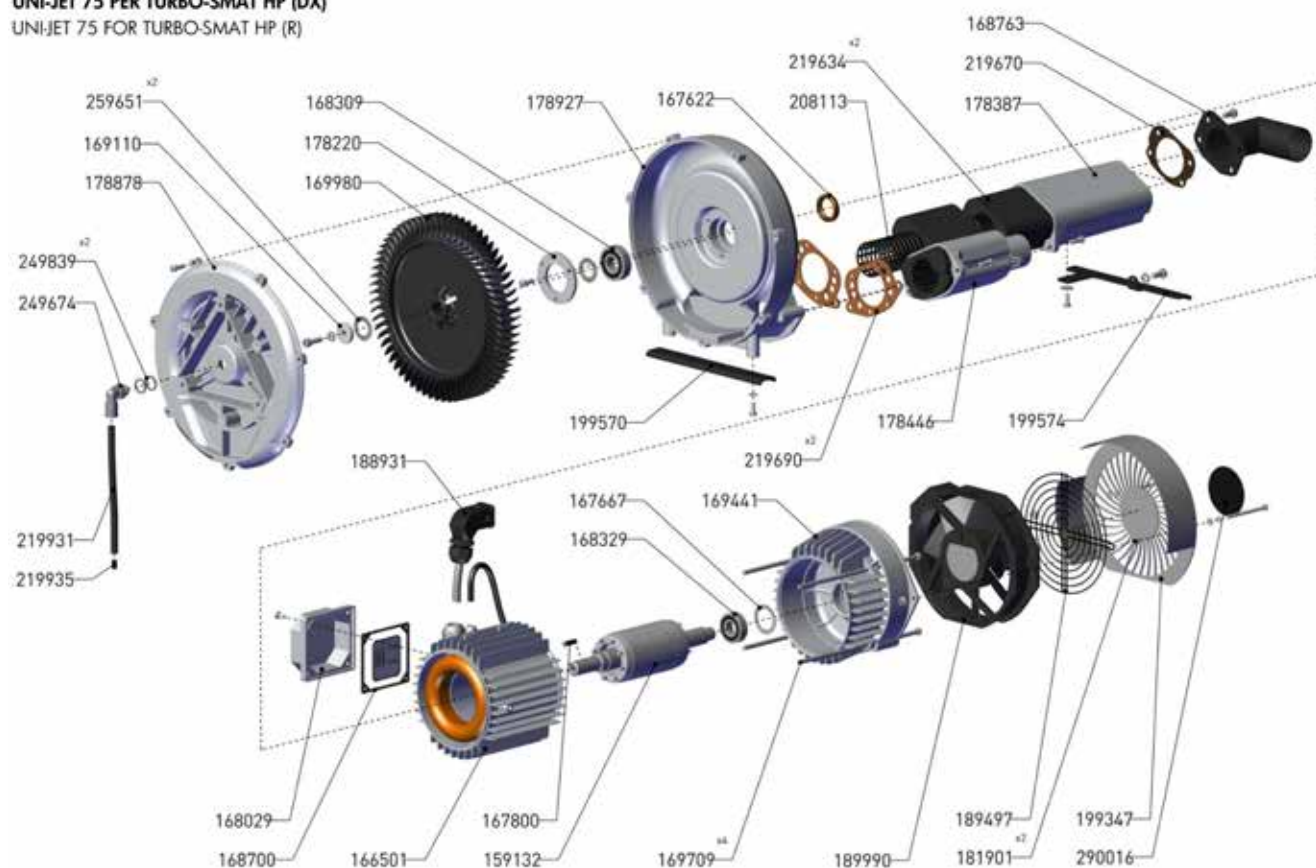


Fig. L

AMALGAM SEPARATOR 043396 EXPLODED VIEW

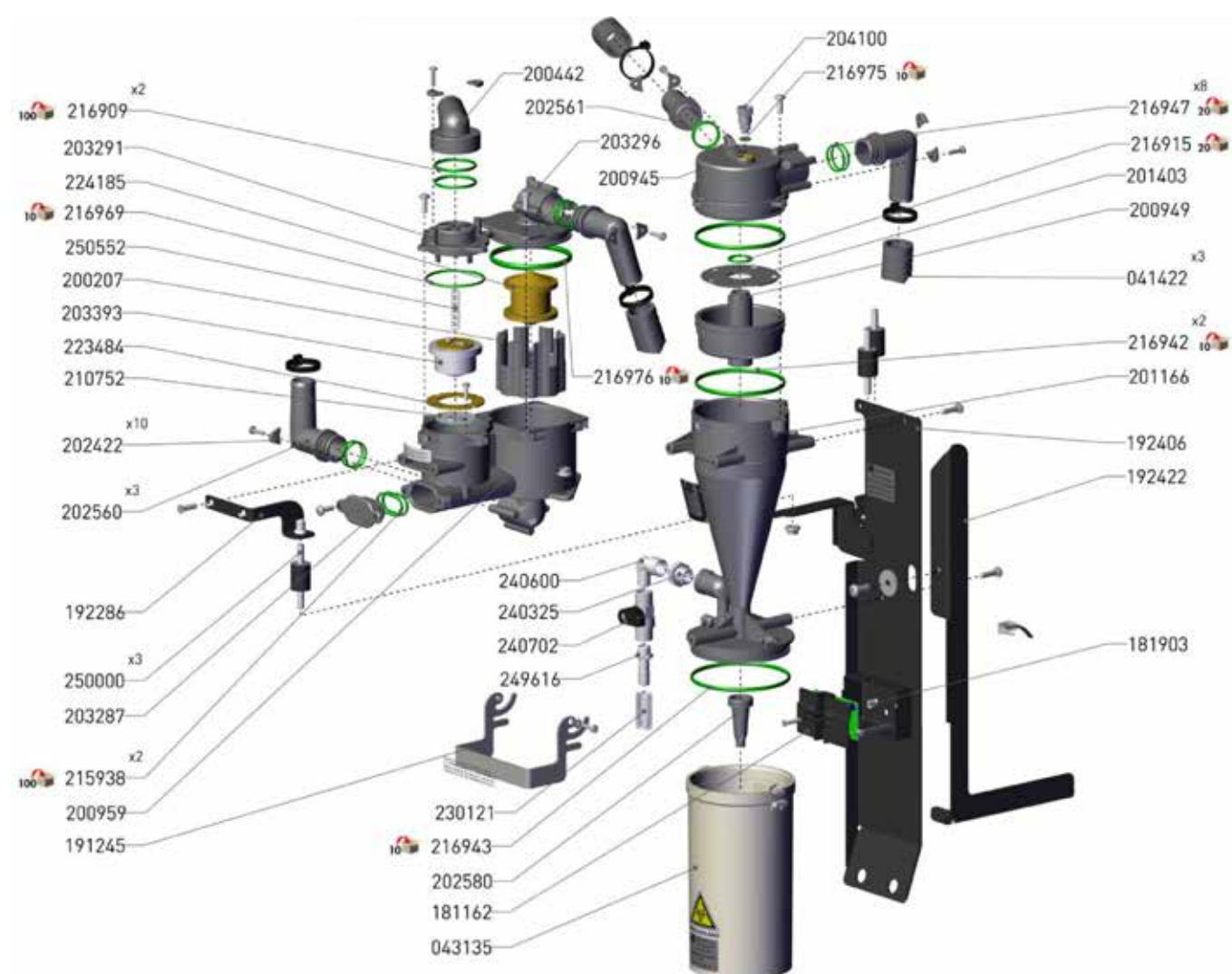


Fig. M

CONTROL UNIT 023764 EXPLODED VIEW

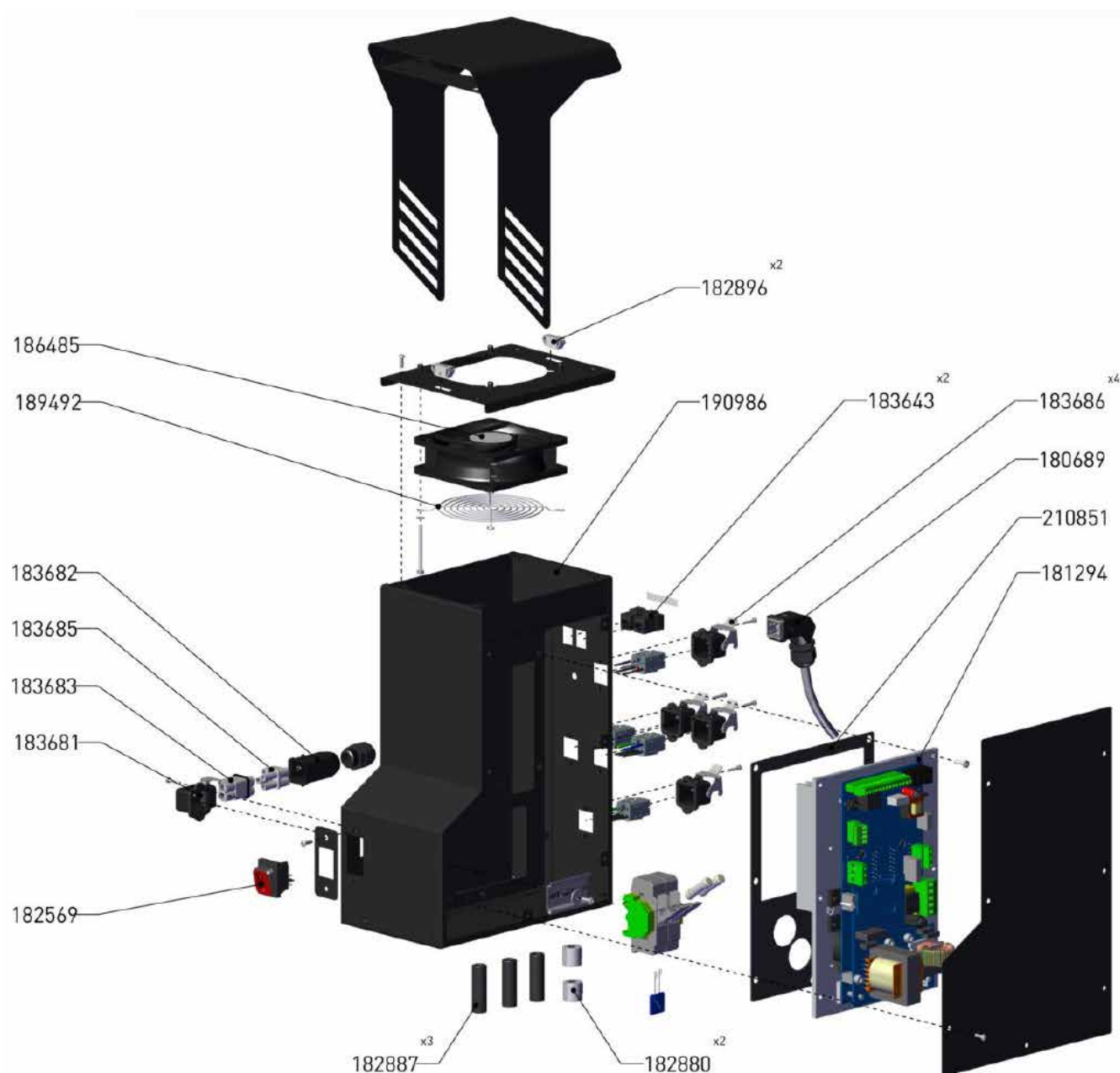


Fig. N

TURBO SMART HP DIMENSIONS

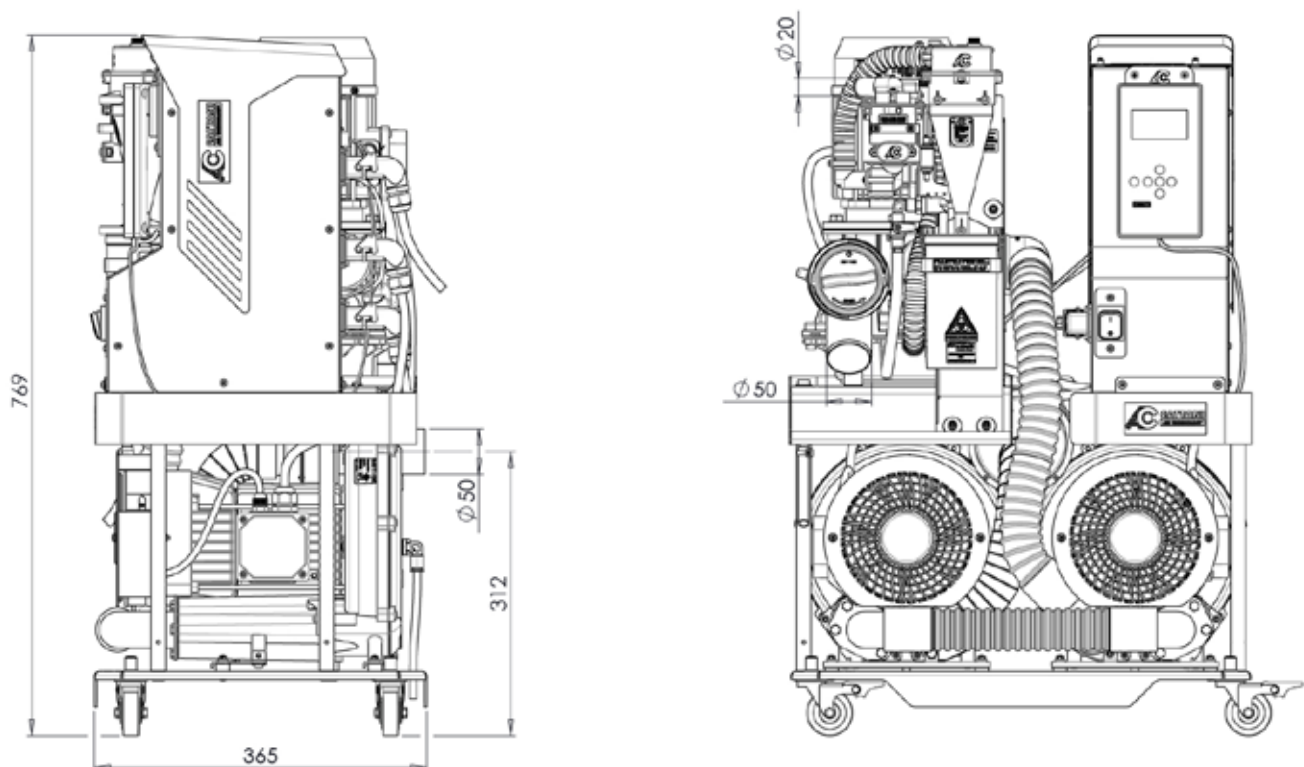


Fig. 0

TURBO SMART HP DIMENSIONS

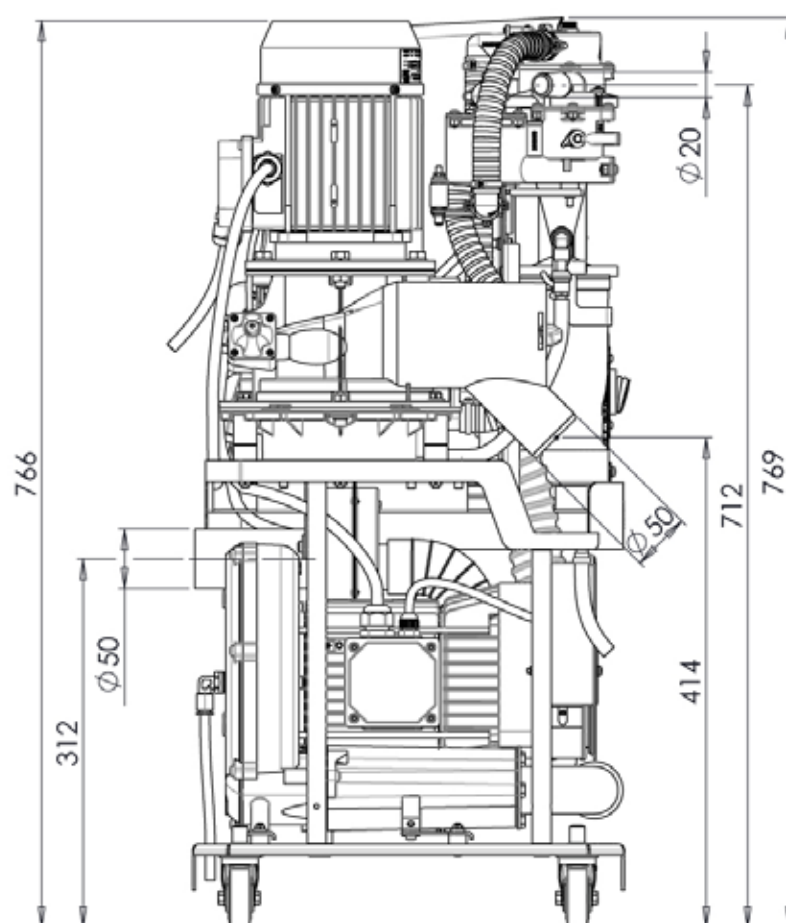


Fig. P

TURBO SMART HP DIMENSIONS

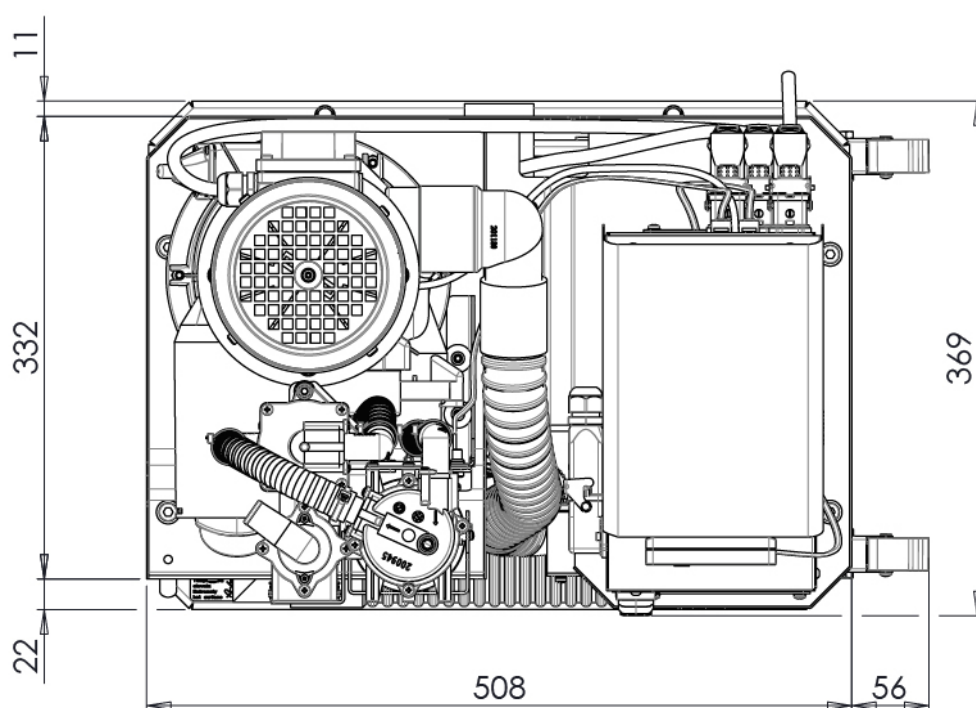


Fig. Q

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FOR 50 YEARS:
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Company with Quality System certified = **ISO 9001** = and = **ISO 13485** =

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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.