FORTADOR™
powered by Lamborghini

FORTADOR

Pro 10
(not available in USA, Canada and LATAM)
Pro 16
Pro 20
(not available in USA, Canada and LATAM)

INDUSTRIAL STEAM CLEANER
OPERATING MANUAL

NOTE

Before starting, read this operating manual carefully in order to avoid improper use or situations that may be dangerous for people, animals or objects. The manufacturer shall bear no responsibility and shall exclude the possibility to apply guarantee terms in the following cases:

Any misuse or use in improper conditions, any damage resulting from normal wear-out or aging, inappropriate application, neglect, improper operation or storage, exposure to moisture, arbitrary modification or repair, improper installation, using wrong power supply source, operator errors, failure to obey this operating manual, or any other events for which the manufacturer cannot be blamed, including any loss or damage in transport.

CONTENTS

INTRODUCTION

Thank you for purchasing FORTADOR PRO 10/16/20 industrial steam cleaner.

The FORTADOR brand is an effect of our long-standing experience, and a response to our Customers' needs. The technology confined in the state-of-the-art enclosure provides for higher capacity and performance as well as lower failure rate than ever before.

The solutions used, which only occur in FORTADOR steam cleaner, make it possible to make the machine operation easier and faster. The possibility to feed two different detergents at the same time is a solution that has never been used so far. The 7-inch touch display keeps the user inform on the status of fluids (water, fuel, detergents) inside the machine, and on the running pressure of the boiler.

The heart of the machine is its boiler and burner assembly supplied by the world-renowned manufacturer, Lamborghini Caloreclima. The highest quality of the combustion system and low Diesel oil consumption provide for even faster return on investment. Additional 16.6 – 36.6 kW power regulation has made it possible for us to achieve working pressure in the range of 12 - 20 bar.

TECHNICAL SPECIFICATION AND DESCRIPTION OF THE MACHINE

Technical data

Power supply	230 V, 50 / 60 Hz lub 110 V, 50 / 60 Hz
Power	650 W
Protection class	IPX4
Working pressure	12 – 20 bar
Maximum pressure	20 bar
Steam temperature	Max. 140° C
Boiler temperature	Max. 260° C
Fuel consumption	0.6 l / h
Boiler capacity	10.5 litres
Water tank capacity	20
Fuel tank capacity	10
Detergent tank capacity	5
Noise level	79 dB
Dimensions (W x L x H)	50 x 86 x 91 cm
Weight	95 kg (without fluids and accessories)

Technical data are placed at the rating plate at the rear wall of the cover in the area marked with the red frame. When contacting our Service Dept., please always refer to your machine's serial no. from the rating plate.

Manufacturer:	Fortador Europe
Model:	Fortador Pro S
Voltage:	230V AC 50-60 Hz
Power:	650W IPX4
Rated pressure:	1,0 / 1,6 / 2,0 MPa
Max. pressure:	1,4 / 2,0 / 2,3 MPa
Max. rated temperature:	260 °C
Empty weight:	95 kg
S/N:	A010001
Manufacturing year:	2022

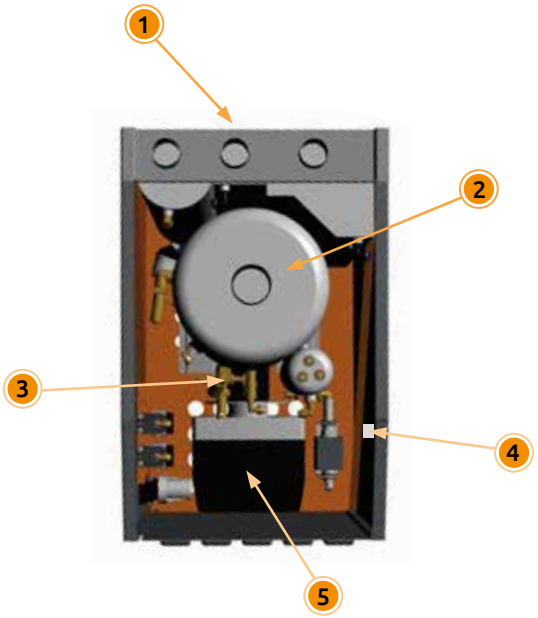
FORTADOR powered by Lamborghini

CE

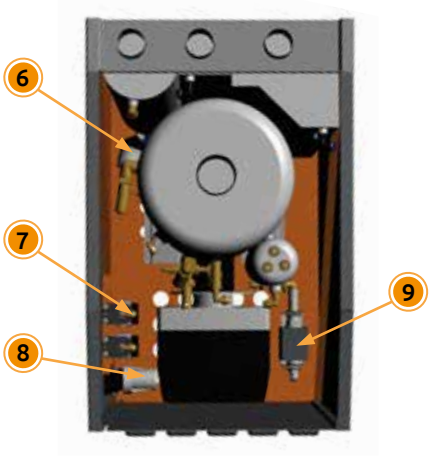
Before use read the instruction carefully! Made in European Union

DESCRIPTION OF THE MACHINE

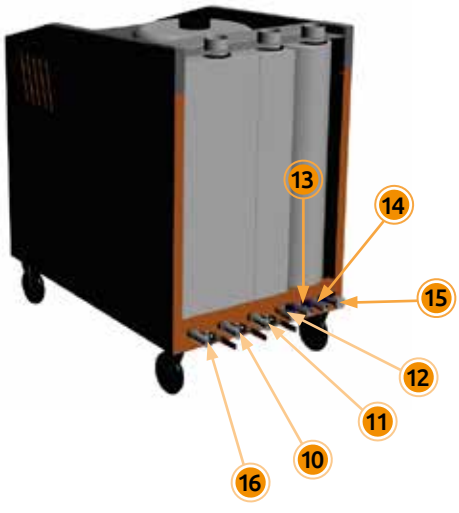
1. Detergent, water, and fuel tanks
2. Boiler
3. Hydraulic line, washing – solenoid valve, valve
4. Pressure sensor (presostat)
5. Burner



6. Fuel filter – fuel filter valve, tank fuel drain valve
7. Wet steam and detergent pumps
8. Water filter
9. Water pump



10. Cleaning hose connection – safety quick coupling, valve
11. Cleaning hose connection – safety quick coupling, valve
12. Water drain – valve
13. Detergent drain – valve
14. Fuel drain – valve
15. Permanent water connection – valve
16. Boiler steam drain – quick coupling, valve



SAFETY REQUIREMENTS

The FORTADOR steam cleaner is an industrial machine that must not be operated by persons who are not aware of hazards associated therewith.

Guidelines and recommendations contained in this Manual must be properly understood and obeyed if the condition of the machine proper and safe operation of is to be fulfilled.

Just as in case of most mechanical machines, all relative safety precautions must be observed while operating and servicing the machine. Failure to observe this Operating Manual and recommendations contained in it may lead to injury or damage to the machine or other objects situated nearby. At the same time, it must be borne in mind that it is not possible to present any exhaustive guidelines or recommendations, which would make it possible to completely eliminate risks during its operation or maintenance, and while handling or using chemical products that this machine has been designed to process. In case of special applications and working conditions, some additional safety precautions can turn out to be necessary, which are not discussed in this document. In such non-discussed cases, the user should obey generally adopted safety rules.

Before starting and operating the machine, please read this Operating Manual thoroughly.

This Operating Manual should be stored for later use or for the successive owner.

IMPORTANT:

This machine heats up to high temperatures! Protective gloves and protective goggles must be worn while operating the machine.

During operation, hearing protectors must be worn!

Never use the machine without wearing protective boots.

- Operating pressure can be dangerous for people and animals.
- Operators should be sober, adult, and trained in machine operation and maintenance.
- Spare parts cannot be different than those recommended and manufactured by the manufacturer.
- In case power supply cable is damaged, it must be replaced by an authorised service-provider under pain of loss of guarantee.
- Water tank must be filled with tap water only. Do not add any detergents, chemicals, or descaling agents to the water tank.
- **Do not use distilled water!**
- Before starting the machine, check if its operational openings are free from dirt.
- It is only allowed to use original hoses and guns.
- Do not start the machine if its electrical cable or any other part is damaged.
- Do not operate the machine in the rain or when it is wet.
- Never tilt or topple the machine when switched on.
- Always switch off the machine before cleaning.
- Children are absolutely not allowed to contact the machine.
- Be careful while working near children or animals.
- Do not use the machine when damaged or when its power supply cable shows any signs of damage. In case the machine fails to work the way it should, if it fell or got damaged or was left outdoors or flooded, contact our service dept.: help@fortador.com
- Do not try to pull or lift the machine by its power supply cable or hose.
- Watch for hoses, guns, filters, and seals. As consumables, they are covered by limited guarantee only.
- Never direct steam towards people or animals.
- Keep the machine away from naked flame, radiators, ovens or any other heat sources.

- Do not use the machine in any confined, insufficiently ventilated areas. Its fumes may pose a threat to your health.
- Do not operate the machine in an environment with very high humidity of the air and/ or highly dusted areas.
- When in operation, the machine should not be moved.
- **The machine should be connected to electrical installation that is provided with reliable earthing. It is forbidden to operate the machine connected to electrical installation no earthing, as it may pose a threat of electric shock!**

- **Prior to each start-up, check residual-current circuit-breaker for proper operation in line with the procedure as described in the "before each start-up" chapter. It is forbidden to operate the machine with faulty residual-current circuit-breaker, as it may pose a threat of electric shock!**

- Do not submerge the machine or any of its components in water or any other fluids.
- It is strictly forbidden to use the machine in explosive areas.
- Never use the machine close to toxic / hazardous substances.
- Never install the machine on temperature-sensitive foundations.
- Do not leave the machine in places exposed to the forces of nature.
- Do not operate machine buttons / valves using excessive force.
- The machine should be installed on stable level ground. Make sure that its front wheels are secured during operation.
- Never block the gun's trigger.
- Never leave the machine working unattended.
- Do not direct steam jet towards electronic devices.
- While washing your car, make sure that the nozzle is more than 10 cm away from the surface.
- When not in use, the machine should be switched off and drained.
- Use only good quality fuel diesel. Use of any fuel other than diesel, or any fuel that is contaminated or diluted, may result in damage to the burner and loss of guarantee.
- Remember that the hose bending radius can never be lower than 10 cm. Bending the hose to a tighter radius results in teflon breaking, and, in consequence, in hose damage.

UNPACKING

1. Carefully remove the machine from its packaging.
2. Check if the machine has not been damaged while being shipped.
3. Check if its standard equipment is complete.
   We recommend to keep the packaging.

Packaging dimensions

STANDARD ACCESSORIES

Cleaning hose, 2 pieces

Short lance, 1 piece

Repair kit

Briefcase

BEFORE EACH START-UP

In order to provide for the machine's proper and safe operation, this procedure should be conducted before it is started.

1. Check if your hoses have been properly connected.
2. Make sure that your valves work properly.
3. Re-fill the water tank.
4. Make sure that your hoses and guns are not damaged.
5. Do not put any heavy objects on hoses, and do not drive your car on them.
6. Make sure that your steam supply valves are closed if you do not use your gun for a longer time (10 minutes).
7. Check residual-current circuit-breaker operation by pressing the Test button marked with a red square (the machine should switch OFF). Operating the machine with faulty residual-current circuit-breaker is strictly prohibited.
8. Before starting the machine the operator should always check cleanness and tight the cover of water and diesel filter.

HOW TO INSTALL AND USE THE MACHINE FOR THE FIRST TIME

FORTADOR PRO S machine starting procedure.

1 Re-fill the fuel tank with DIESEL as per the red arrow mark.

Wrong

Right

2 Connect the hoses to quick couplings. Make sure that quick couplings are properly installed.

3 Re-fill the WATER tank or connect the machine to a permanent water connection. Use only pure tap water (max. 20 l) or water with Lamborghini softener (to extend the lifetime of your boiler and all hydraulic assemblies).

Important:
Make sure not to start the machine before you pour the water in.

4 Connect the machine to a 230 V or 110 V socket (depending on version of the machine), and turn the emergency stop ring clockwise.

5 Touch the button on the display to start the machine. The machine will begin to automatically fill the boiler with water, and the burner will be activated as soon as the minimum water level is reached.

6 After 2-7 minutes, the pressure will reach 16 bar. Such message will be displayed on the screen.

Valve open

Valve closed

7 Make sure that hoses are connected correctly. Activate steam supply valves from the boiler to the hoses. Hold the gun trigger pressed until steam starts to come out. Pressure will drop for a moment. When the 16 bar pressure is reached, the machine is ready to work.

CLEANING

1 Holding the gun in both hands, press the trigger. Note: high pressure results in gun recoil when its trigger is pressed. Be careful! **Work using both hands. Pull the hose, do not pull the gun! Do not pull the gun by the hose!**

2 While moving from one area to another, never pull the gun, as this may lead to the connection of the hose with the gun or the gun itself getting damaged.

3 Direct the steam jet towards the surface being cleaned, making sure to keep a safe distance of 10 cm between the gun nozzle and the surface being cleaned.

4 In case of heavy soiling, use the “wet steam” function that is activated using the orange arrow marked button. Steam being fed using the cleaning gun will additionally contain water mist.

5 In order to remove heavy soiling, it may be required to use some detergent together with steam jet. Before activating this function, re-fill the DETERGENT tank with detergent diluted in water in proportions as described in the detergent label.

NOTE: Failure to obey this sequence may lead to detergent pump getting damaged!

It is not recommended to use high-foam and acid pH reaction formulations.

6 On the screen, activate Detergent feeding, using the button that is marked with the orange arrow.

7 Upon completion of work, close the steam supply valves to the hoses, remove the steam that remains inside hoses by pressing the gun's trigger, and then disconnect the hoses from the machine, and proceed in line with the "Switch-Off Procedure" Section.

CONTROL PANEL FUNCTIONS

Main screen

Orange and white background of indicators means that the fluid level is sufficient.

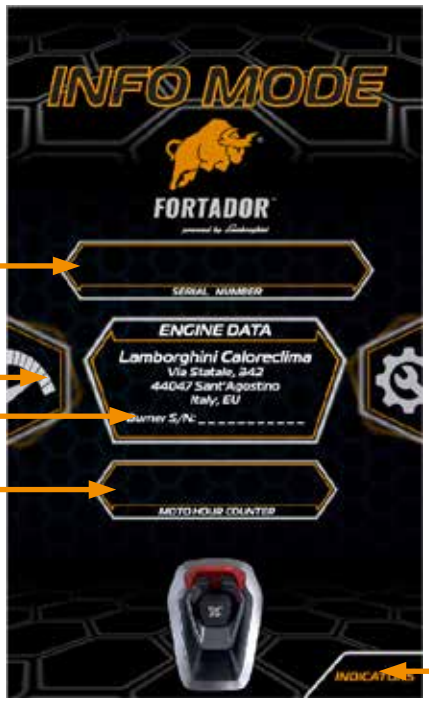
When indicators are shown with a red background, it means that fluids are missing and that they should be re-filled to continue operation.

During water pomp operation or burner operation suitable indicator will be highlighted.

Serial no. display screen

Boiler water level indicator shows the current water level (L – Low, M – Medium, H – High) by backlighting the relative indication in yellow.

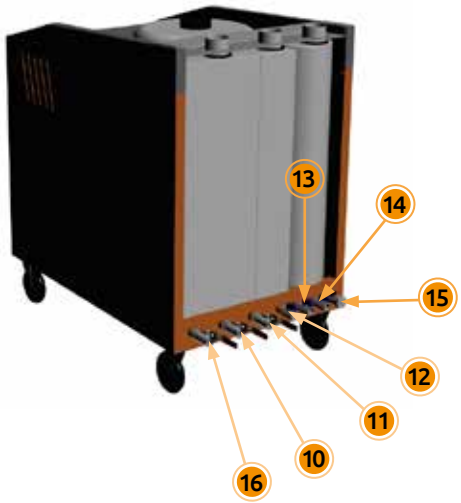
Worked hours count display screen



SWITCH-OFF PROCEDURE

In order to prolong your FORTADOR machine lifetime, take due care of your machine and obey the Switch-Off Procedure as presented herein.

1 Switch off the machine using the button on the touch screen, and then disconnect it from its power supply. NOTE: Failure to observe this sequence may result in damage to the machine's controller.



2 Close the steam supply valves to the hoses (no. 10 and 11), press the gun's trigger to release any steam that still remains inside hoses.

3 Disconnect the hoses, clean them and roll them up, being careful not to exceed the allowable bending radius (min. 10 cm); **NOTE: Bending the hose to any radius that is tighter than allowed will result in its damage!**

4 If the machine was connected to an external water supply source, disconnect the supply hose from valve no. 15.

5 Place the machine so that the boiler draining outlet is directed into the open space. Carefully open valve no. 16, paying special attention to the steam that is coming from the outlet. High-pressure steam jet may lead to serious burns!

6 Drain the boiler completely, leaving valve no. 16 in its open position. This valve can only be closed just before you start your work.

7 Clean the machine if dirty. By cleaning the machine each time after you finish your work, you will keep it in very good technical condition for a long time.

8 Leave the machine in dry, warm area that is free from dust.

9 If the machine is to be stored in temperatures below 0°C (32 F), it must be drained from all fluids (water, detergent, fuel) using valves nos. 12, 13, and 14. Then, all the water must be pumped out from the water system, by entering the maintenance mode by pressing the Maintenance mode button that occurs for several seconds in the upper part of the display when the machine is started.

Przycisk uruchamiający tryb serwisowy

Przycisk uruchamiający tryb serwisowy

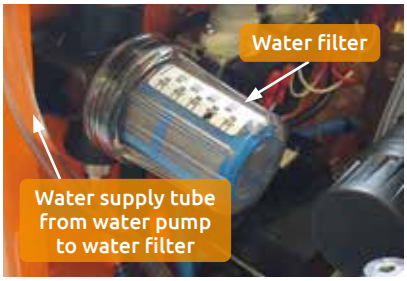
Przycisk uruchamiający tryb serwisowy

Button used to start detergent pump in maintenance mode

Button used to start water pump in maintenance mode

Button used to start wet steam pomp in maintenance mode

10 Afterwards, by pressing the button marked with orang arrow, the water pump will be run for 5 seconds pumping out any remaining water from the water system into the boiler. Repeat this procedure several times, watching if any water is still present in the tube that supplies water into the water filter, and in the filter itself. If you cannot see any water coming out, do not start water pump any more to avoid dry running.



11 The last step is to remove the water from the water filter by unscrewing its plastic dome and draining the rest of water. When dry, re-install the dome on the water filter.

MAINTENANCE PLAN

The FORTADOR steam cleaner is made of best materials. In order to keep it in its perfect condition, it requires scheduled maintenance in line with the below maintenance plan.

MAINTENANCE OPERATIONS	TIME INTERVAL (WORK HOURS COUNT)
Clean the water filter and the fuel filter	100
Check (water, detergent, fuel) sensors	150
Check burner electrodes, and clean the combustion chamber	200
Descaling	50 - 200 (depending on water hardness)
Replace balls and springs in the cleaning gun	200

Within the guarantee period, scheduled maintenance must be performed by the guarantee-issuing party or the authorised dealer. Failure to observe this condition will result in loss of guarantee.

SERVICE SCREEN

After reaching the right amount of motohour, according to the maintenance plan, Fortador steam washer will report automatically the need to check the relevant components by displaying the appropriate service screen.

1 Water and fuel detergent filter cleaning required

2 Control of water, detergent and fuel sensors required

3 Burner electrodes inspection required

4 Descaling device required

5 The ball and spring in the cleaning gun need to be replaced

FAQ

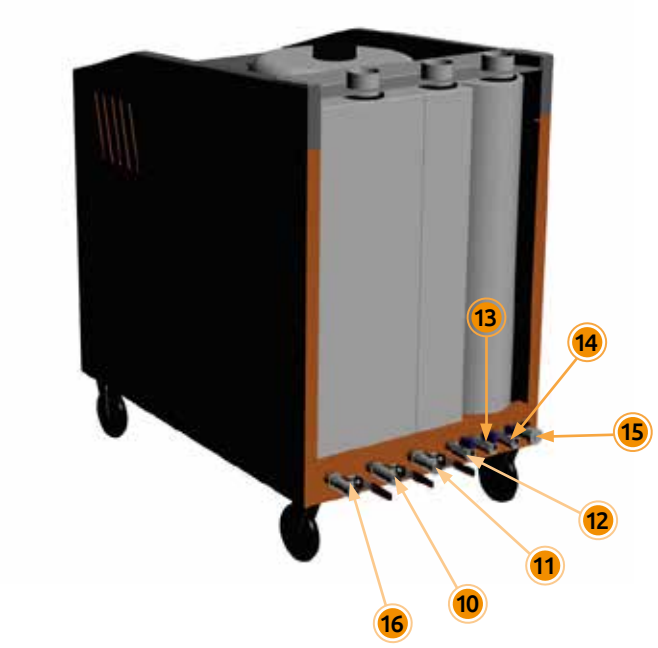


Fig. 1

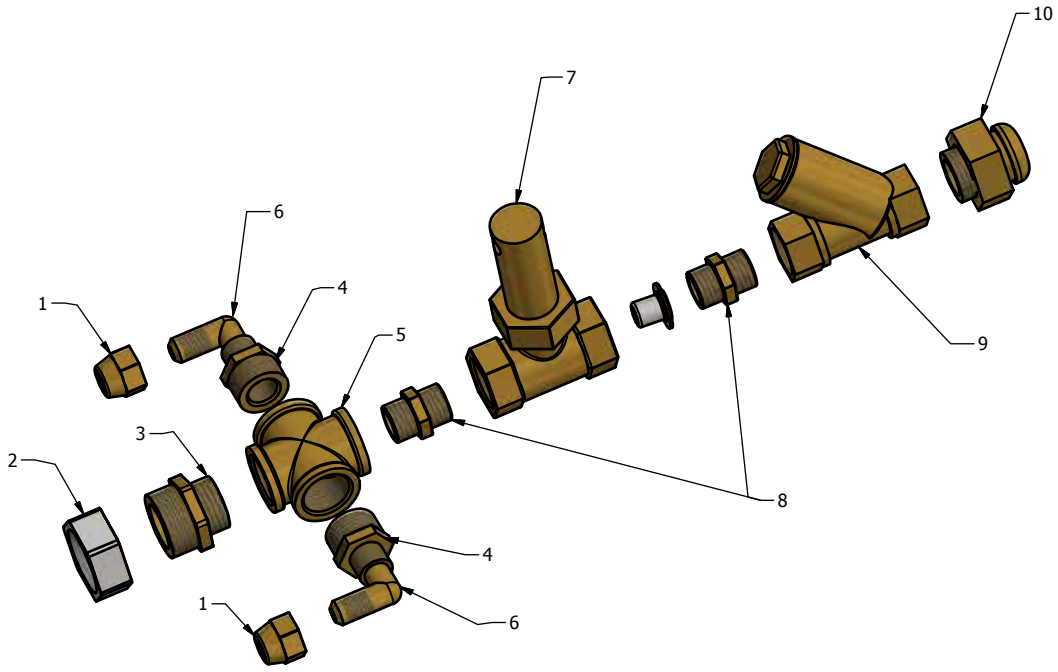


Fig. 2

1 problem

Freezing tubes in the boiler supply line in winter time, bubbles in the water line tubes, broken water filter, faulty water pump.

Diagnosis

This indicates that the machine has been left in freezing conditions at temperature below 0°C without having emptied the boiler and the water flow line.

Prevention

Stop the machine using the red button. Empty the boiler by opening the water drain valve and draining the steam and rest of water. Open the water tank's water drain valve in order to empty the water tank according to procedure described in section "Switch-off procedure" points 10-12.

Solution

Replace water filter, replace water pump.

2 problem

Damaged detergent tanks, damaged water tank.

Diagnosis

This indicates that the machine has been left in freezing conditions at temperature below 0° C without having emptied water and detergent tanks.

Prevention

Open the water drain valves and detergent tanks Fig. 2 element 5 / 6 / 7. Empty the tanks from water and detergent at temperatures below 0° C.

Solution

Replace tanks and level probes in fluid tanks.

3 problem

No pressure in the boiler, or to the contrary: the display shows pressure, while there is little steam at hose outlets; boiler heats up insufficiently and too long.

Diagnosis

Scaled boiler, scaled steam outlet system and / or cleaning / washing hoses.

Solution and prevention

Perform the boiler descaling procedure using the Limescale Remover preparation. Switch off the machine, connect all cleaning and washing hoses to quick couplings properly. Empty the boiler and the water tank by opening drain valves. When the machine is stopped and emptied, unscrew the coupling that connects the four-terminal network with the copper tube Fig. 2. Using a syringe, inject some Limescale Remover into the copper tube. Wait till it starts to boil, and slowly add small portions in order to thoroughly dissolve the mineral deposit inside the tube. After approx. 20 minutes, re-connect the coupling to the four-terminal network. Close the boiler drain valve and the water tank drain valve. Pour approx. 1–2 litres of Limescale Remover into the water tank. Start the machine, wait till the water pump sucks the entire Limescale Remover in from the water tank. As soon as the machine stops and begins to squeal, add water into the tank. Pour the water in until the machine starts both the burner and the boiler. When the boiler is heated up (16 bar), leave the machine for approx. 5–30 minutes, depending on the system's scaling degree, in order to completely dissolve the scale. When the scale dissolving process is completed, flow the steam several times by pressing the trigger at the successive hoses in order to flush the silicon / Teflon steam line and couplings from any remaining scale. Empty the boiler using the drain valve completely. Start the machine 2–3 times by filling the

boiler, and heating and draining it through the individual cleaning and washing hoses. The machine is descaled now. Obviously, depending on the hydraulic system's flow capacity (or scaling), scale can also occur in elements Fig. 2 elements 1–13, which should also be cleaned within the descaling process, depending on situation. Pay special attention to the steam presence sensor (Fig. 2, element 11) which should be installed / dismantled with special care and caution.

4 problem

Steam rising from the quick couplings area.

Diagnosis

Cleaning hose connector improperly installed in safety quick coupling.

Solution

Replace silicon O-rings in quick couplings. When replaced, slightly moisten O-ring and quick coupling areas with silicon spray grease.

5 problem

The machine refuses to start after the Start command, does not fill with water up to the boiler L level that is necessary to start the Lamborghini burner.

Diagnosis

Worn out ET3000 water pump (or non-return valve that is part of the pump, or pipe sealants inside the pump), or air bubbles in the water line from the water tank to the boiler.

Prevention

Regularly descale and protect the FORTADOR washer water line against freezing. Do not allow the water pump to be run dry.

Solution

Fill them water tank to the full, so that the water level in the tank is above the water filter height. Loosen the water filter cup, so that the filter can be freely filled with water, remove the transparent tube from water pump inlet and let this tube fill up too, and then slide it fast back to its original location. Now the water pump should easily suck the water in.

While starting the machine, open the valve (Fig. 2 element 9) for a while, till such time as the water pump overcomes boiler pressure and the water pump non-return valve opens (change in the water pump's operating noise from clattering to regular, muffled noise).

NOTE: Long-term "dry" operation of the water pump results in permanent damage to the pump unit!!!

6 problem

Steam coming from:
a) cleaning guns
b) cleaning hose quick-release couplings
c) under the machine
d) cleaning gun handle area

Diagnosis and solutions

AD a) – replace the gun (or try to repair it by replacing gun valve ball and spring or by descaling gun valve with a 50% chance of success in case of the cleaning hose, or replace the solenoid valve in case of the washing hose). AD b) – replace w quick couplings' O-rings, and use silicon grease to provide for necessary slippage of the coupling's friction elements. AD c) – replace the safety valve (it is worn out, and fails to fully close). AD d) – replace swivel joints that connect the gun with the cleaning hose (worn out pipe silicon / Teflon sealant).

7 problem

Buzzing burner – characteristic vibrating noise, burner assembly and boiler assembly are shaking in the resonance (exhaust stream and jet pump inside the boiler).

Diagnosis

Change burner / boiler working conditions:

- Change the fuel (density, calorific value);
- Different atmospheric pressure than in the original adjustment location;
- Different humidity of the air in the machine's place of operation.

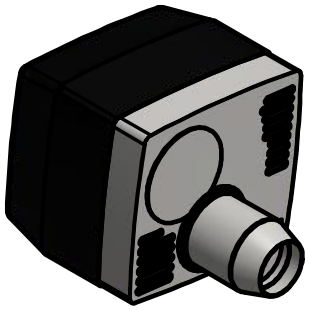


Fig. 3
View of the Lamborghini burner

Prevention

Always use proper and good quality fuel (heating oil or winter fuel is not a good choice). The use of a high quality fuel is a guarantee of repeatability of the burner's operating performance (no need to periodically adjust composition of the fuel / air mixture, and the fuel nozzle does not tend to wear out so fast).

When we have a reduction of density of the air, there is, at equal volume, a lower amount of oxygen, so to burn the same amount of fuel, it is necessary a bigger air volume. Since there is no possibility of increasing the air flow through the burner ventilation, it is necessary to reduce the amount of fuel to be burned down. Of course with this setting there is a reduction in the actual thermal power of the burner.

Attention: The work fields on the entire documentation refer to tests with an air temperature of 15 °C and Altitude of 0 m above sea level (slm).

To quantify this reduction refer to the table below where the correction factor fc is returned to the different operating conditions:
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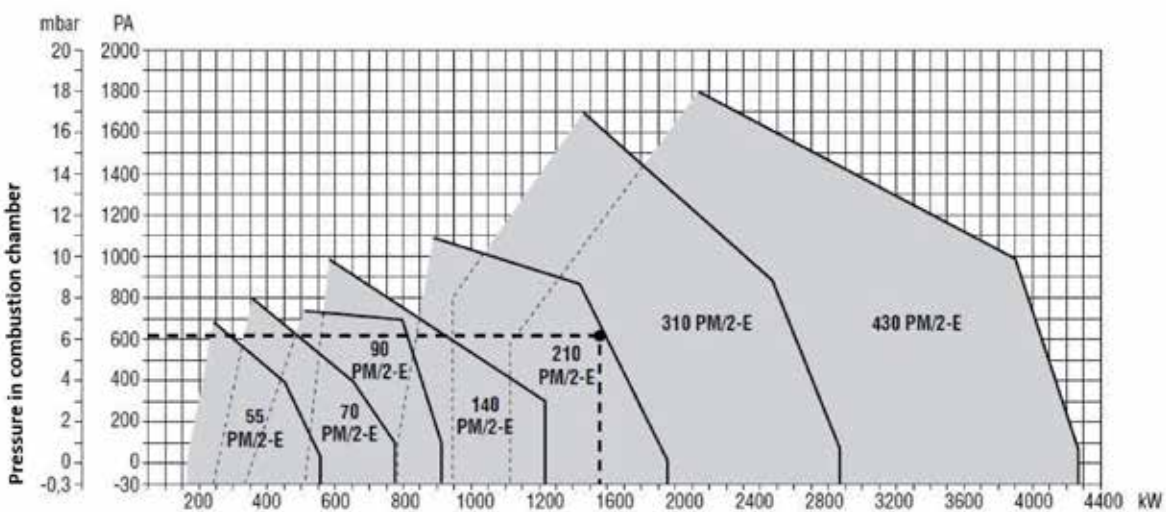
Air temperature	Altitude (m slm)												
°C	0	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000
0	1,071	1,040	1,009	0,978	0,950	0,920	0,895	0,867	0,841	0,813	0,791	0,765	0,741
5	1,052	1,021	0,991	0,960	0,933	0,904	0,879	0,851	0,826	0,798	0,776	0,751	0,728
10	1,033	1,003	0,973	0,943	0,916	0,888	0,863	0,836	0,,812	0,784	0,763	0,738	0,715
15	1,015	0,986	0,956	0,927	0,900	0,872	0,848	0,822	0,797	0,771	0,749	0,725	0,703
20	0,998	0,969	0,940	0,911	0,885	0,857	0,834	0,807	0,784	0,758	0,737	0,713	0,691
25	0,981	0,953	0,924	0,896	0,870	0,843	0,820	0,794	0,771	0,745	0,724	0,701	0,679
30	0,965	0,937	0,909	0,881	0,856	0,829	0,806	0,781	0,758	0,733	0,712	0,689	0,668
40	0,934	0,907	0,880	0,853	0,828	0,803	0,781	0,756	0,734	0,709	0,690	0,667	0,647
50	0,905	0,879	0,853	0,827	0,803	0,778	0,756	0,733	0,711	0,687	0,668	0,647	0,627
60	0,878	0,853	0,827	0,802	0,779	0,754	0,734	0,711	0,690	0,667	0,648	0,627	0,608
80	0,828	0,804	0,780	0,756	0,735	0,712	0,692	0,670	0,651	0,629	0,611	0,592	0,573
100	0,784	0,761	0,739	0,716	0,695	0,674	0,655	0,634	0,616	0,595	0,579	0,560	0,543
150	0,691	0,671	0,651	0,631	0,613	0,594	0,578	0,559	0,543	0,525	0,510	0,494	0,478
200	0,618	0,600	0,582	0,565	0,548	0,531	0,517	0,500	0,486	0,469	0,456	0,442	0,428
250	0,559	0,543	0,527	0,511	0,496	0,480	0,467	0,452	0,439	0,425	0,413	0,400	0,387
300	0,510	0,496	0,481	0,466	0,453	0,439	0,426	0,413	0,401	0,387	0,377	0,365	0,353
							fc						

- hearth input Qf = 1,259 kW
- pressure in combustion chamber Pcc = 6.2 mbar
- altitude installation: 1000 m slm
- Inlet air temperature: 50 °C



Solution

Properly adjust the composition of the fuel / air mixture. Remove the burner's black cover.

a) Make sure that the burner's heating power setting corresponds to boiler size. This adjustment is made using Fig. 4 element 1 by turning a screwdriver to the left or right.

b) Initial setting of the air damper is made by turning the adjustment screw Fig. 6, element 1, for approx. 1 level in line with Fig. 6, element 2.

c) Using a hexagonal Allen wrench no. 4, turn the knob to the left to the end as in Fig. 7, element 1, and then turn the wrench clockwise 1 – 1.5 turn to the right.

Carefully watching the boiler's chimney outlet (there should be no black or white smoke), adjust fuel amount to a satisfying dose (typical setting in the range from extreme left position + 1 turn to the right to 2.5 turns to the right). Make sure that the burner-boiler assembly does not shake in the resonance (characteristic loud rumbling noise). In case fuel pump adjustment range is insufficient, adjust the air damper Fig. 6, element 1 (typical setting range: 0.5 - 2.0). This setting and precision adjustment should be conducted several times until a light flame is achieved in the direct view window as in Fig. 4, element 2. The target adjustment should be performed on a heated machine during a third or fourth boiler heating (normal operation mode), whereas precision adjustment refers to the machine's cold start procedure.

NOTE: Since it is not possible to adjust the burner by performing steps as above, the fuel nozzle must be worn out. Dismantle the burner and replace the nozzle.

NOTE: Watch for proper installation of fuel supply line (Fig. 7 element 5) and fuel return line (Fig. element 4) as per Fig. 7.

Fuel nozzle replacement should be accompanied by proper setting of ignition electrodes. Distance from nozzle head to ignition electrodes, and from ignition electrodes to the swirl vane: as in Figures 8 and 9.

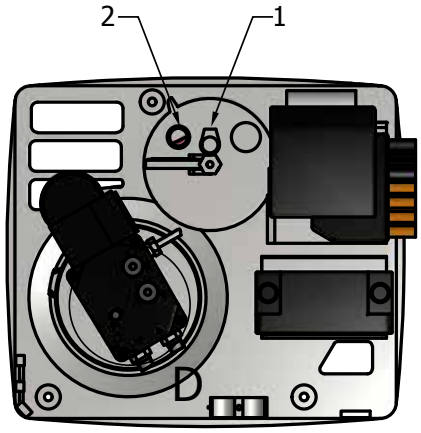


Fig. 4
View of the burner from the rear

Fig. 5
View of the damaged fuel head in the burner

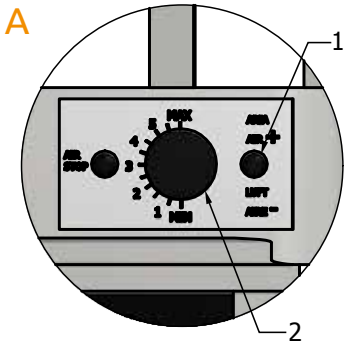


Fig. 6
View of the air damper regulator

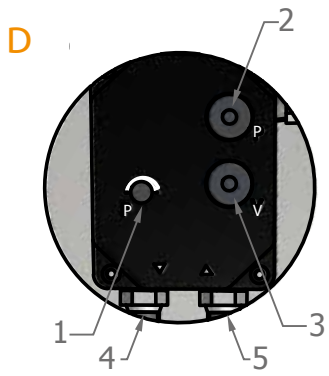


Fig. 7
View of the fuel pump

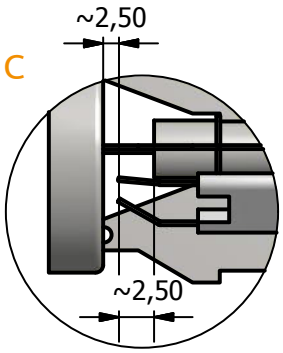
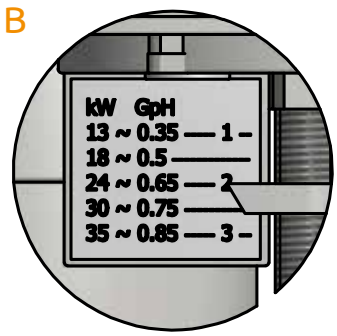
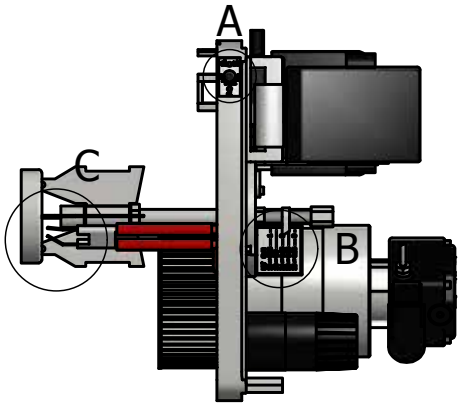


Fig. 8

Fig. 9



Setting the burner's heating power in line
with the plate placed as in Fig. above



View of the burner having been removed from the machine
View from the top, with its protective cover removed

8 problem

Touching the machine or the hose results in a soft tingling feeling.

Diagnosis

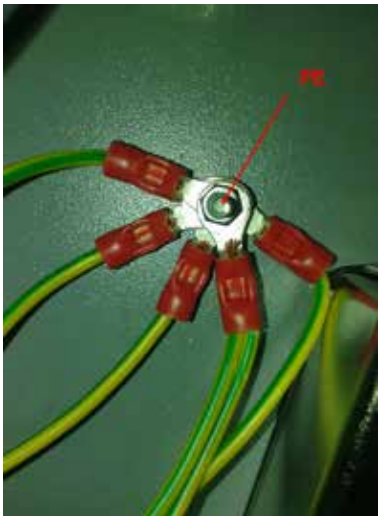
- Electrostatic charge build-up on the surface of the machine (gas or liquid flow in plastic or Teflon hoses).
- High humidity of the air in the machine operation location, especially in Asian countries or weakly ventilated rooms.
- Possible washing gun breakdown as a result of excessive moisture in the installation / switches of the washing gun.
- Possible breakdown as a result of damaged control cables in the washing hose (silicon cable insulation damaged).

Prevention

Provide for good, sufficient ventilation where the machine is operated. Do not pull the washing hose exerting excessive force (as this may result in damage to the rope that limits washing hose length and in failure / rupture of the control cable insulation in the washing hose). Regularly inspect electrical installation for the condition of insulation and earthing (especially the earth wire). From time to time, check the temporary electrical installation, i.e. all sorts of extension cords or adapters. It is not allowed to use any double-wire or garden extension cords. Use only extension cords in double rubber insulation designed for outdoor use.

Solution

Use additional grounding for the machine in the form of low-resistance earthing rod driven into the earth and connected to the body of the machine with a copper rope minimum 4 mm² in order to dissipate electrostatic charge build-up. Earth wire connection locations in the machine: as in Figures below.



Residual-current circuit-breaker with overcurrent protection protects the user against touch voltage and leakance. It is absolutely necessary to test it as described in “Before each start-up” chapter by pressing the Test button in normal operation mode. When the Test button is pressed, this safety device should be activated to disconnect power. In various machines’ residual-current circuit-breakers, the Test button is located as below.

One of conditions of proper protection against electric shock is that the machine’s electrical installations must be periodically inspected by entities authorised thereto to. Pay special attention while you repair or adjust your machine, as most of its elements are very hot, and you can get serious burns if you touch them directly. Since this is a pressure machine, be careful when you operate or adjust it. In the event its pressure system is unsealed when in operation, you can undergo severe burns from high-temperature steam. Persons who perform maintenance / adjustments at this machine should hold relative permits and logbooks that allow them to carry out maintenance/ adjustments on thermal pressure equipment (Group G2 energy licence) and electrical equipment (Group G1 energy licence).

Lamborghini burner error codes and ways they are indicated

MACHINE STATUS INDICATOR	
Condition	**LED colour**
Standby mode, other intermediary modes	No light
Fuel heating in the burner starting phase, waiting time max. 5 seconds	Yellow
Fuel / air mixture ignition stage	Yellow, flashing
Proper operation	Green
Improper operation, the infrared sensor cannot see any flame	Green, flashing
Voltage drop	Yellow / red, flashing alternately
Burner blocked	Red
Error	Red, flashing
Scattered light on the sensor prior to mixture ignition	Green / red, flashing alternately
Self-diagnostics	Red, quick flashing

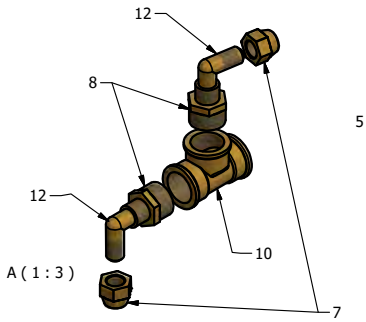
If the burner is in the blocked mode, it will be indicated by non-flashing red colour of the LED at the back-lit button on top of the burner. By pressing transparent button on top of the burner for a short time only, the entire burner start, operation and self-diagnosis control process is skipped. By pressing this transparent button and holding it depressed for at least 3 seconds, the burner start and diagnosis control process is commenced (the red light will flash fast). The Table below explains some possible burner blockage cases, depending on error occurrence in the burner start and self-diagnostics procedure. This information is available by counting the number of flashes of the red LED (always the red one). The diagnosis function can be discontinued by pressing the button on burner enclosure and holding it depressed for at least 3 seconds.

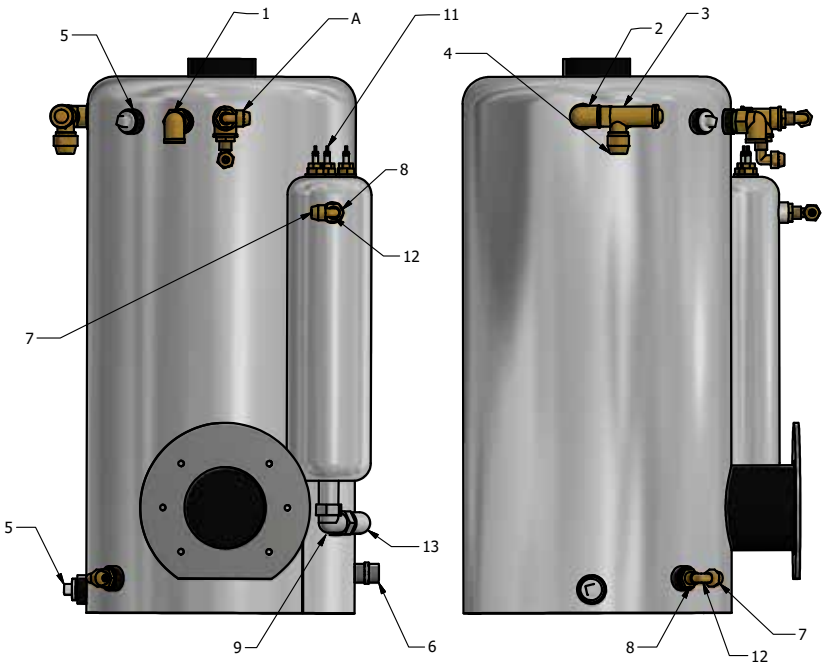
Diagnosis of burner equipment elements, errors and reasons for its operation blockage

List of Anomalies		
Visual information		**Possible reasons**
2 flashes	★★	No flame presence signal from the infrared burner sensor • damaged fuel valve, • damaged flame detector, • improper burner fuel / air mixture composition setting, or no fuel, • no ignition.
3 flashes	★★★	N/A
4 flashes	★★★★	"Wrong" light during the mixture ignition procedure; flame detector has sensed improper ignition or leakage in the combustion chamber
5 flashes	★★★★★	N/A
6 flashes	★★★★★★	N/A
7 flashes	★★★★★★★	No flame presence signal from the infrared burner sensor during burner operation: • damaged fuel valve, • damaged flame detector, • wrong burner fuel / air mixture composition setting, or no fuel.
8 flashes	★★★★★★★★	Fuel pre-heating time disturbance
9 flashes	★★★★★★★★★	N/A
10 flashes	★★★★★★★★★★	Wrong electrical power supply or internal failure of burner controller

List of spare parts, and the machine's exploded view drawings

Lp.	Numer części Part No.	Numer katalogowy Catalog No.	Ilość Quantity
1.	001	SH00103	1
2.	002	SH00019	1
3.	003	SH00127	1
4.	004	SH00046	1
5.	005	SH00032	2
6.	006	SH00080	1
7.	007	SH00047	4
8.	008	SH00071	4
9.	009	SH00105	1
10.	010	SH00116	1
11.	011	SE00154	3
12.	012	SH00023	4
13.	013	SH00026	1

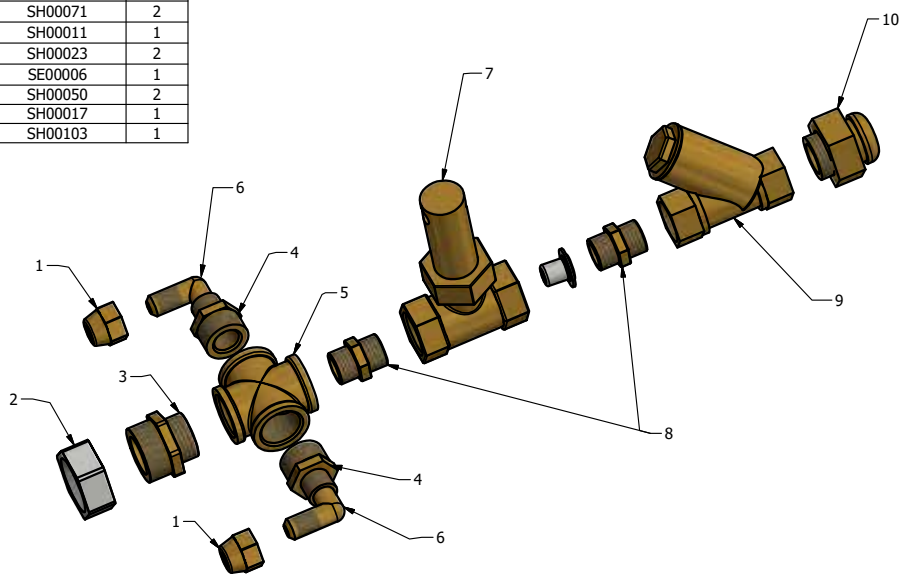




Narysowany przez	Sprawdzony przez	Zatwierdzony przez		Date	
Anna Wiraszka	Marek Chaciński	Krzysztof Traczyński		2020-01-18	

Fortador PRO 10/16/20		
PRO-S-000-001-01	Skala 1 : 5	Arkusz 1 / 1

Lp.	Numer części Part No.	Numer katalogowy Catalog No.	Ilość Quantity
1.	007	SH00047	2
2.	015	SM00030	1
3.	016	SH00055	1
4.	008	SH00071	2
5.	018	SH00011	1
6.	012	SH00023	2
7.	019	SE00006	1
8.	020	SH00050	2
9.	021	SH00017	1
10.	022	SH00103	1



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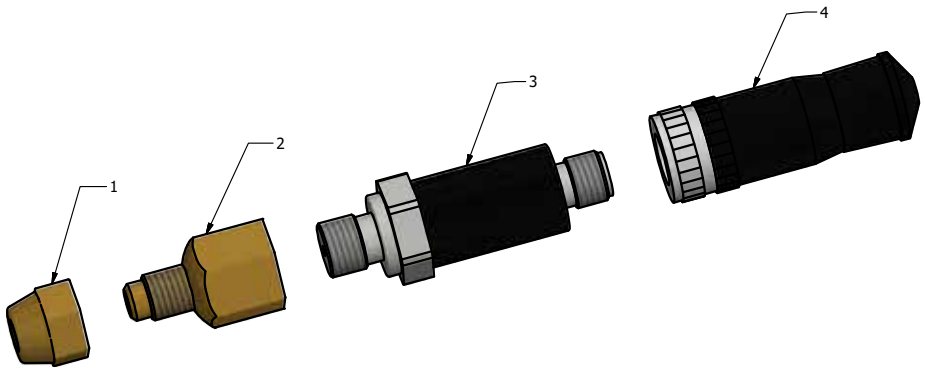
Fortador PRO 10/16/20		
PRO-S-000-002-01	Skala 1 : 2	Arkusz 1 / 1

Lp.	Numer części Part No.	Numer katalogowy Catalog No.	Ilość Quantity
1.	007	SH00047	1
2.	023	SH00076	1
3.	024	SE00094	1
4.	025	SE00174	1



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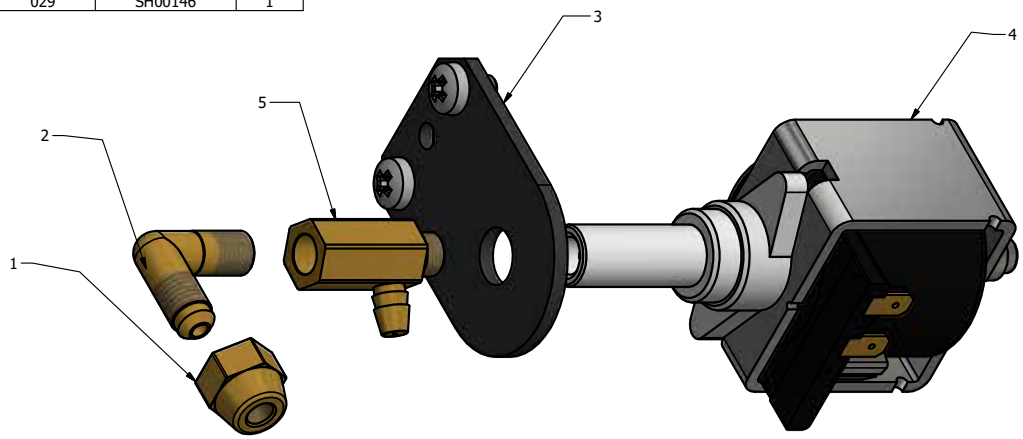
Fortador PRO 10/16/20

PRO-S-000-003-01	Skala 1 : 1	Arkusz 1 / 1

Lp.	Numer części Part No.	Numer katalogowy Catalog No.	Ilość Quantity
1.	007	SH00047	1
2.	026	SH00024	1
3.	027	SM00074	1
4.	028	SE00087 (110V) SE00088 (220V)	1
5.	029	SH00146	1



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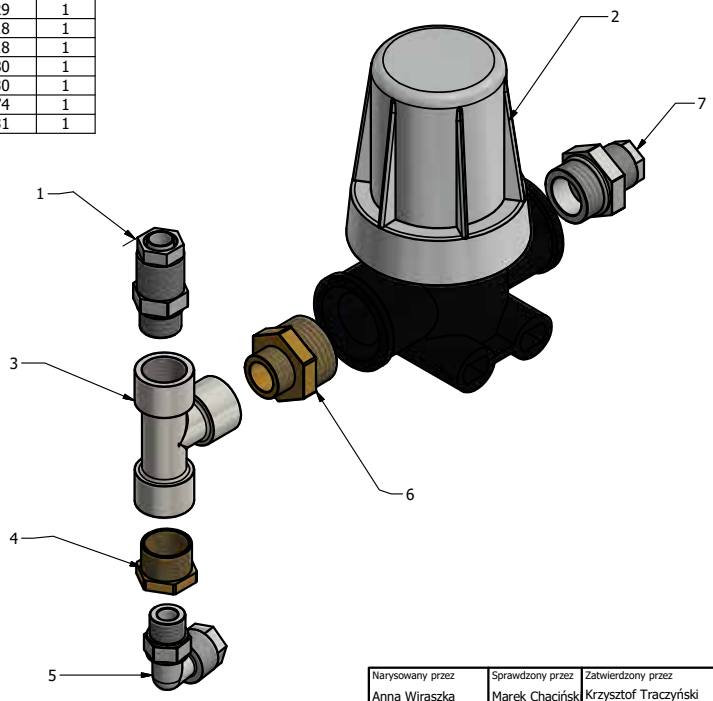
Fortador PRO 10/16/20

PRO-S-000-004-01	Skala 1 : 1	Arkusz 1 / 1

Lp.	Numer części Part No.	Numer katalogowy Catalog No.	Ilość Quantity
1.	030	SH00129	1
2.	031	SH00018	1
3.	032	SH00118	1
4.	006	SH00080	1
5.	033	SH00130	1
6.	034	SH00074	1
7.	035	SH00131	1



Narysowany przez	Sprawdzony przez	Zatwierdzony przez		Date	
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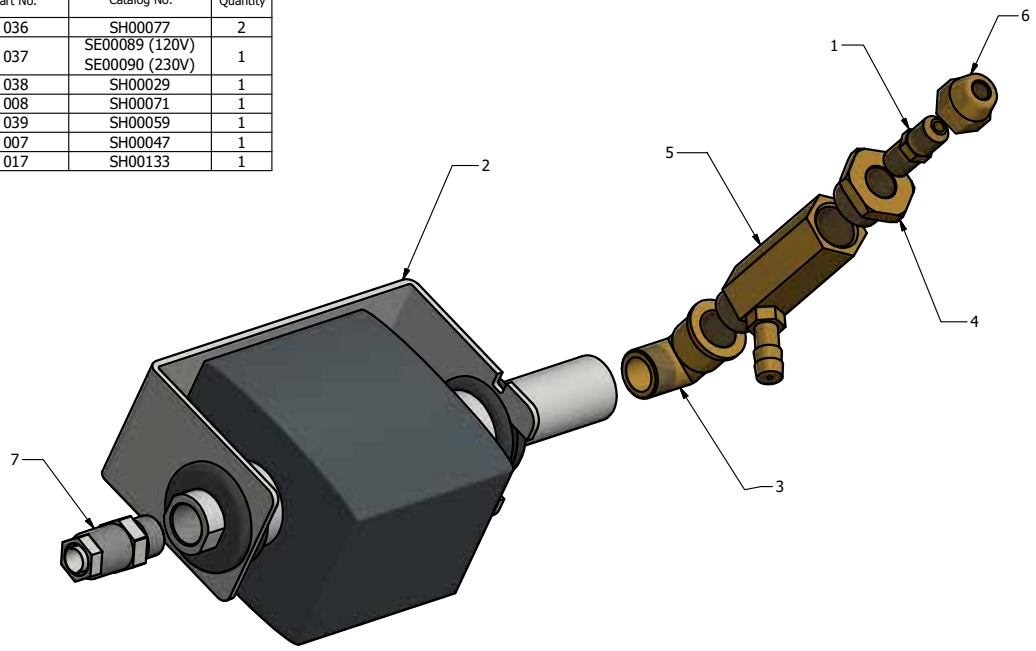
Lp.	Numer części Part No.	Numer katalogowy Catalog No.	Ilość Quantity
1.	036	SH00077	2
2.	037	SE00089 (120V) SE00090 (230V)	1
3.	038	SH00029	1
4.	008	SH00071	1
5.	039	SH00059	1
6.	007	SH00047	1
7.	017	SH00133	1



Narysowany przez	Sprawdzony przez	Zatwierdzony przez		Date	
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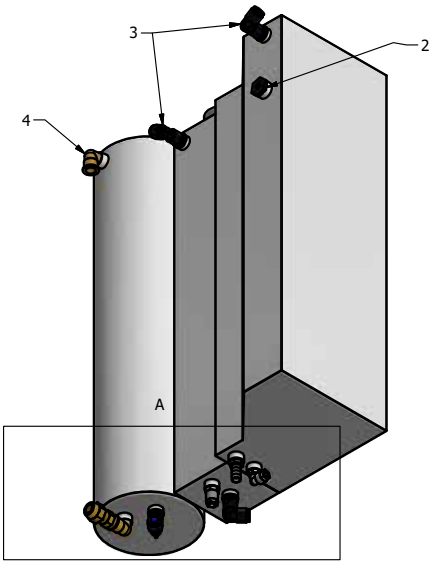
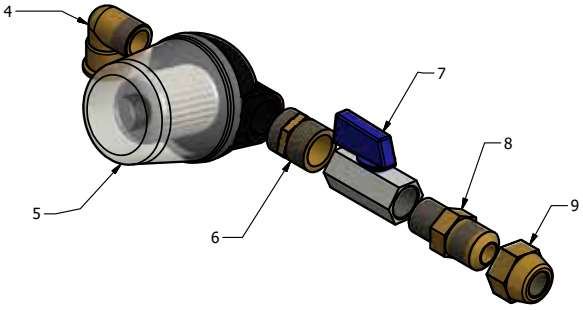
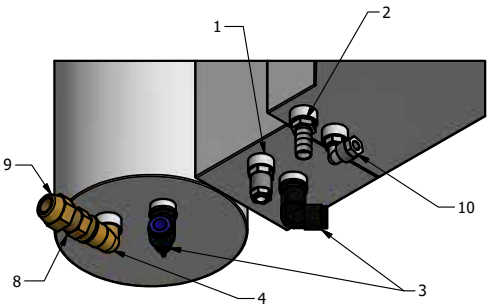
Lp.	Numer części Part No.	Numer katalogowy Catalog No.	Ilość Quantity
1.	040	SH00039	1
2.	041	SE00155	1
3.	042	SH00097	4
4.	043	SH00029	3
5.	044	SH00015	1
6.	020	SH00050	1
7.	045	SH00126	1
8.	036	SH00077	1
9.	004	SH00046	1
10.	033	SH00130	1







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Fortador PRO 10/16/20

PRO-S-000-007-01 | Skala 1 : 5 | Arkusz 1 / 1

Lp.	Numer części Part No.	Numer katalogowy Catalog No.	Ilość Quantity
1.	042	SH00051	3
2.	043	SH00124	3
3.	040	SH00126	3
4.	044	SH00125	1
5.	045	SH00053	3
6.	046	SH00109	2

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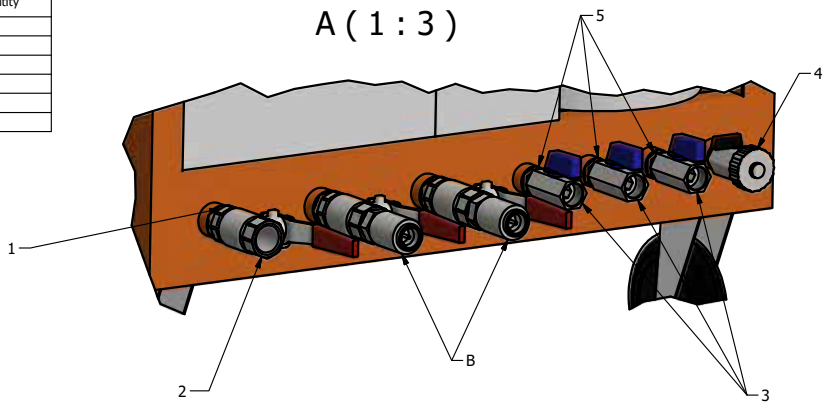

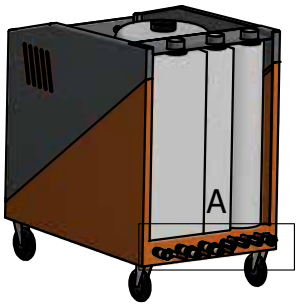

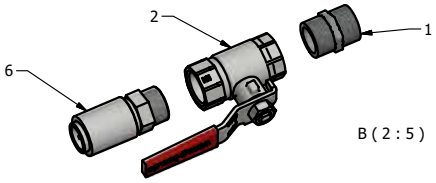

B (2 : 5)

Narysowany przez	Sprawdzony przez	Zatwierdzony przez		Date	
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FORTADOR

Fortador PRO 10/16/20

PRO-S-000-008-01 | Skala 1 : 14 | Arkusz 1 / 1

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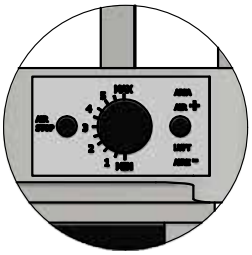

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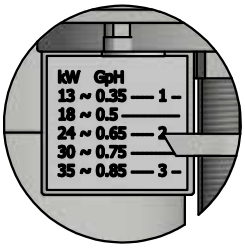

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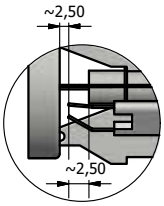

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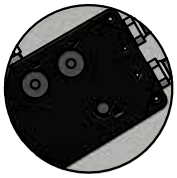

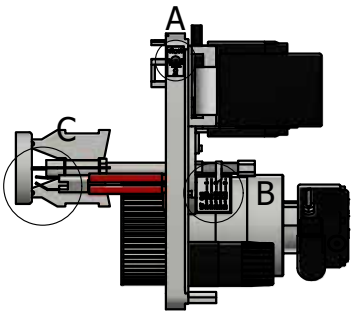

Narysowany przez	Sprawdzony przez	Zatwierdzony przez		Date	
Anna Wiraszka	Marek Chaciński	Krzysztof Traczyński		2020-01-18	

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CE ATTESTATION OF CONFORMITY

Applicant	Fortador K.A. Traczyńscy Sp.J. Aleja Krakowska 108 05-090 Sękocin Stary, Poland
Manufacturer	Fortador K.A. Traczyńscy Sp.J. Aleja Krakowska 108 05-090 Sękocin Stary, Poland
Equipment Under Test	Steam cleaner
Trade Name	Fortador
Model Name	PRO 10 / 16 / 20
Type of Test	89 / 336 / EEC
EUT Powered during test	AC 230 V / 50 Hz
Technical Standards	EN 55014-1 EN 55014-2 EN 60335-1 EN 60335-2-79 EN 61000-3-2 EN 61000-3-3
Date of test	11-14.07.2017

This CE-Attestation of Conformity is issued according to the Directive 89/336/EEC relating to electromagnetic compatibility on a voluntary basis. If confirms that the listed equipment complies with the principal protection requirements of the EMC directive and applies only to the sample and its technical documentation submitted to TÜV SÜD Product Service GmbH for testing and certification.

CE After preparation of the necessary technical documentation as well as the conformity directives have to be observed.

TRANSPORT

The machine can be transported by any means of transport, provided that it is properly fastened (e.g. using straps) and secured against damage in its original box delivered together with the machine.

Make sure that the machine's front wheels are correctly secured, and that straps are properly tensioned to avoid the machine moving.

During transport, the machine cannot be filled with steam, and it must be drained from all fluids. In case it is planned to be transported in temperatures below zero, its water system must be drained as described in Section "Switch-Off Procedure" Points 9–11.

FINAL REMARKS

When properly operated and maintained, this FORTADOR steam cleaner can provide long years of reliable operation. Problems that may occur when using the machine should be solved before it is started. While operating any machine, it is necessary to know its normal operation in order to be able to identify its improper operation. Obey all generally adopted precautions while operating any electrical or hydraulic equipment. This Operating Manual has been written in order to thoroughly explain the operations that can be performed using this machine. Its operators must read and understand this Operating Manual before they can begin solving any problems. Any repairs performed by the user on his own within the guarantee period are prohibited, and shall result in loss of guarantee. Therefore, in case of any problem or doubt, please contact our Service Dept.

e-mail: help@fortador.com
tel. +48 791 400 166

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