



ELECTRIC CLEANING MACHINE USER MANUAL

FS SERIES



Zhejiang Botuolini Machinery CO.,LTD.

Important Notice

*Please read this manual carefully before using this cleaning machine.

*Please note that the most important contents in this manual will be indicated as follows.



Failure to follow instructions may result in death, injury or serious damage to the washer.





Failure to follow instructions may result in serious personal injury or washer damage.



The operator should take special precautions to avoid damage to the washer.

This manual is a permanent part of the cleaning washer and should be attached when the cleaning washer is transferred to others.

SAFETY MARK	INSTRUCTIONS
	Read the instructions carefully before operating the washer
	High pressure jet water is potentially dangerous. Don't spray water to people, animals, electromechanical equipment, and power supplies.

SAFETY MATTERS

1. In order to ensure the safe use of the washer please read this manual carefully before use, to prevent accidents and unnecessary losses caused by improper use.

⚠ WARNING Read the instructions carefully before operating the machine.

2. Before the first use, must check the high pressure pump oil level scale reached more than half.

⚠ WARNING No oil is added in the pump, it is forbidden to start up or test run.

3. According to the safe electricity usage rules, when using this washer, it is necessary to carefully check the supply power to ensure that the voltage and current meet the requirements, and the power supply must be installed leakage protection switch.
4. When using this washer, it must be safely grounded. It must be matched with the leakage protection switch with grounding wire. When not in use, the power supply should be cut off in time.

⚠ DANGER Use this washer must be safely grounded, the power supply must be installed leakage protection switch.

5. When using this washer, users are not allowed to change the "non-reconnection plug" on the original product without authorization.
6. Don't use the washer in the rain, don't spray the washer with water.

⚠ DANGER Do not connect the power supply with wet hands.

7. Do not move the cleaning washer by pulling the power cord, and do not throw the power cord anywhere.

⚠ WARNING When cleaning, do not place the power cord on the road or intersection.

8. The washer should use normal temperature water, water temperature is not more than 50°C, water pressure is not less than 2bar, do not use the machine at 0°C or below.
9. Do not use the washer with people who are not wearing protective clothing. Do not turn the shower on yourself or someone else to rinse clothes or rain boots.
10. Continuous water supply must be ensured when the washer is working. Running the washer without water will cause damage to some equipment. Please do not allow the washer to run for more than 2 minutes with the spray gun turned off.

11. When cleaning, pulling the trigger handle of the spray gun will cause a rebound. Be sure to hold the spray gun handle with both hands. Because the rebound water flow has a high speed, so do not tie the high pressure water pipe when using, to straighten the water pipe, to avoid the loop.
12. The high pressure water from the high pressure cleaning washer will destroy wood, glass, motorcycle paint and other surfaces, but also damage the edges of various objects and various such as flowers, bushes, etc. Before spraying, check the water flow to ensure that the cleaning object will not be damaged by the strong force of the spray. With the exception of concrete and steel, high-pressure clustered jets should be avoided.



High pressure jet water is potentially dangerous. Do not spray at people, animals, mechanical and electrical equipment and power supplies.



13.High pressure water pipe, joint and spray gun are the important parts of the washer. In order to ensure the safety of the machine, we can only use the original parts provided by our company.

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Do not use the washer if the power line or important parts of the washer such as safety device, high pressure water pipe, spray gun, are faulty.

14. If the motor, electrical failure, must ask professional maintenance department for maintenance, so as to avoid danger.



Pressure cleaners should not be used by children or untrained persons. It is forbidden to leave the machine running when unattended.

15. High pressure cleaning washer should be placed horizontally when working, not allowed to tilt. The user should be familiar with the work-ing principle and structure of the cleaning washer, and know how to stop the washer in an emergency and how to operate all the control parts. Never allow untrained people to operate the washer. Insist on regular maintenance, troubleshooting in time.



Cut off the power supply before cleaning washer maintenance.

16. After the washer is put into use for a long time, please dial the motor impeller connected to the water pump several times in the state of power failure before starting the washer.

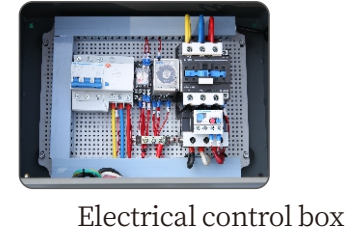


the user must operate and use the washer according to the above "safety matters", the manufacturer will not assume any responsibility for the unexpected or inappropriate operation of the non-standard operation.

APPLICATION FIELD

- Automobile service industry: car wash, car repair and beauty cleaning business.
- Hotel/guesthouse: building exterior wall, glass curtain wall, hallway steps, boiler room, kitchen, parking plant, public places, etc.
- Municipal administration/sanitation: dredge pipes, square, public health facilities, small wall advertising cleaning, garbage trucks, garbage cans, garbage room cleaning, etc.
- Construction industry: building exterior wall surface renovation, concrete mixing station, oil or stubborn stains on the decorative surface, cleaning transport vehicles.
- Railway industry: cleaning and decontamination of locomotives, locomotive chassis and axles, oil stains, rust stains, platform tracks and ditches.
- Tobacco/pharmaceutical: mixing equipment, assembly line, vehicle, production workshop, pipeline, medicine tank equipment, chemical storage tank dirt cleaning, etc.
- Machinery manufacturing: workshop equipment, ground, workshop and pipeline scale, oil cleaning, casting parts, mold cleaning.
- Food/brewing: equipment, blender, assembly line, fermenter, pipeline, ground oil cleaning.
- Oil field petrochemical industry: oil scale and scale cleaning of drilling platform and equipment, oil tanker, oil pipeline, oil production equipment, etc.
- Paper/rubber: equipment, floor, water tank and other chemical sediment cleaning.
- Aircraft/ship/automobile: spray room, machinery, grid floor paint cleaning, runway degumming, ship deck dirt cleaning decontamination.
- Power/water: transformer, condenser, boiler ash system cleaning, pipeline cleaning and dredging.
- Logistics/storage: transportation vehicles, workshop cleaning.
- Metallurgy/casting: cleaning steel making, iron making, steel rolling and other workshop equipment and the ground on the dirt, transport vehicles, casting sand removal, paint removal rust.
- Mining industry: mining car, transport belt, underground operation line and hard well cleaning, due to coal, stone dirt caused by equipment blockage dredge.
- Defense/industry: Removal of residue from ammunition bay.

PRODUCT MIX



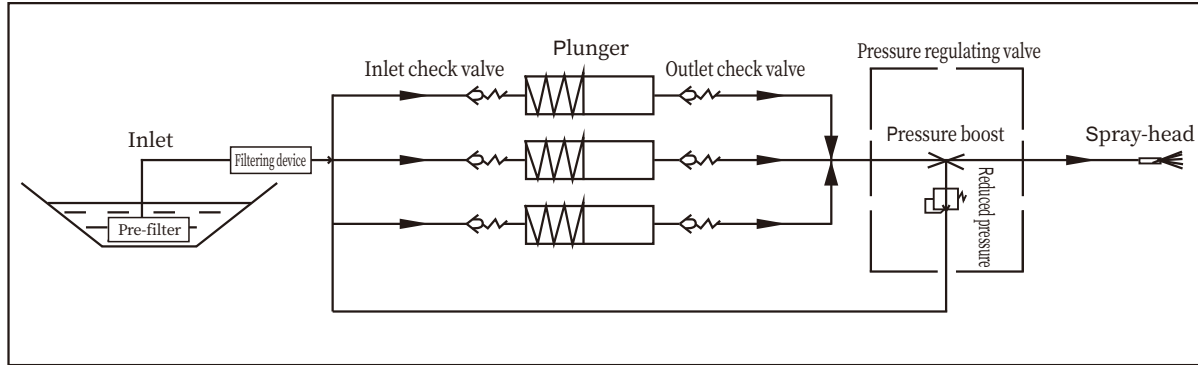
MODEL PARAMETERS

Fs Series

Model	FS-1535	FS-2323	FS-1935	FS-2250	FS-2260
Maximum Flow	15Lpm/3.96Gpm	23Lpm/6.08Gpm	19Lpm/5.02Gpm	19Lpm/5.02Gpm	22Lpm/5.81Gpm
Maximum Pressure	350Bar/5075Psi	230Bar/3335Psi	350Bar/5075Psi	350Bar/5075Psi	600Bar/8700Psi
Pump Head Model	ST	ST	ST	DS	DS
Pressure Regulating Valve	VB400	VB400	VB400	VP53	VP53
Autoswitch	Yes	Yes	Yes	/	/
Motor Power	10kW	10kW	15kW	22kW	25kW
Motor Speed	1450rpm	1450rpm	1450rpm	1450rpm	1450rpm
Voltage&HZ	380V/50HZ	380V/50HZ	380V/50HZ	380V/50HZ	380V/50HZ
Outlet Hose	15M	15M	15M	15M	15M
Inlet Hose	3.5M	3.5M	3.5M	3.5M	3.5M
Filter	Yes	Yes	Yes	Yes	Yes
High Pressure Gun	Long Gun	Long Gun	Long Gun	Long Gun	Long Gun
Nozzle Tips	4 Tips	4 Tips	4 Tips	Threaded Nozzle(0°、15°)	Threaded Nozzle(0°、15°)
N.W	200KG	200KG	200KG	380KG	380KG
Product Size	103*72*85cm	103*72*85cm	103*72*85cm	103*72*85cm	103*72*85cm
Package Size	110*76*87cm	110*76*87cm	110*76*87cm	110*76*87cm	110*76*87cm

WORKING PRINCIPLE

Working principle diagram



Working principle:

After the power is turned on, the electric motor drives the shaft of the high-pressure plunger pump to rotate, and the pump shaft causes the plunger to move back and forth through the crankshaft connecting rod mechanism.

- When the movement of the plunger increases the volume of the pump chamber in the cylinder block, the inlet check valve opens, the outlet check valve closes, and the oil enters the pump chamber through the inlet check valve through the inlet pipe.
- When the movement of the plunger reduces the volume of the pump chamber, the inlet check valve is closed, and the outlet check valve is opened. The oil in the pump chamber passes through the outlet check valve and outlet pipe to the trigger type spray gun, and after pulling the trigger of the spray gun, it is discharged from the spray gun.
- When the trigger of the spray gun is not triggered, the pressure from the pump chamber pushes the differential plunger inside the pressure regulating valve, and it returns from the outlet to the inlet, circulating inside the spray pump. At this time, the temperature will rise sharply. Therefore, when the spray pump is operating, it should be avoided to close the spray gun for a long time to avoid damage to the spray pump.

DIRECTIONS FOR USE


1. When unpacking the case

According to the packing list, check if the components are complete and intact. If any damage is found during transportation, please inform us promptly.

2. Use requirement

- Inlet pipe should be at least 1/2 inch in diameter.
- The washer has automatic water absorption function, our company suggests to use clean water without sand particles, flow not less than 15.01./min (if directly connected to tap water, water supply pressure is not more than 2bar, flow not less than 15.0L/min).
- The water supply temperature cannot exceed 50 ° C
- Always hold the handle of the spray gun with both hands when performing cleaning operations.
- under normal circumstances, the working pressure of the cleaning washer has been set before leaving the factory, please do not adjust by yourself.
- If the gun needs to be closed during use, we strongly recommend not to close the gun for more than 2 minutes.

3. Preparation before startup

- Check whether the nuts and screws are loose before starting the washer.
- Check oil level of high pressure pump.
-  no oil is added in the pump, it is forbidden to start the pump.

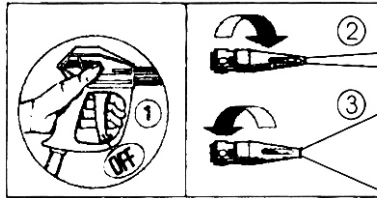
DIRECTIONS FOR USE

4. Outlet pipe connection

Connect the quick change plug of the high-pressure outlet pipe with the quick change head of the pump outlet (the quick change joint connection method is: move the quick change joint clip with the left hand, insert the quick change plug with the right hand, loosen the quick change joint clip, and push it back to the original position). The other threaded end of the high pressure pipe is connected with the spray gun and fastened.

5. How to use spray gun

①Adjustable spray gun (G-07):



This spray gun has the following characteristics:

High pressure flow shape can be adjusted from 0° straight line to 60° conical Angle. By rotating the nozzle counterclockwise or clockwise, the gun handle must be closed before operation.



When adjusting the spray gun flow shape, it is necessary to close the spray gun before adjusting it, otherwise the high pressure water flow with excessive resistance may damage the spray gun.

Rotating sprinkler gun



This spray gun has the following characteristics:

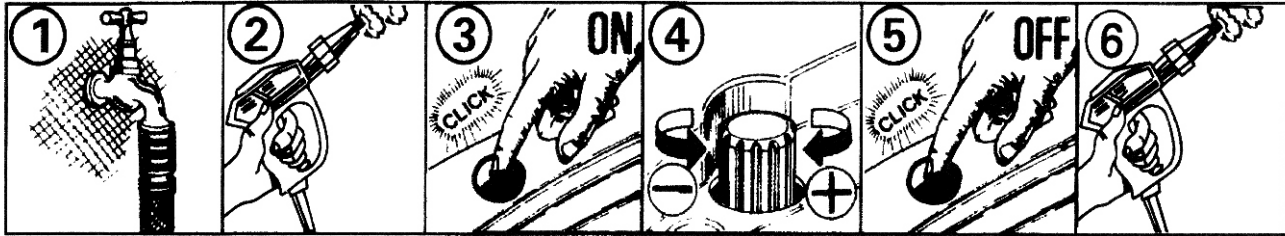
the jet water with rotating nozzle is a high-speed rotating beam collection, with wide spray surface, high pressure, water saving and energy saving characteristics.



The high-pressure water from the high-pressure cleaner will damage the surface of wood, glass, motorcycle paint, and also damage the edges of various objects, such as flowers, bushes, etc. Before spraying, check the water flow to ensure that the cleaned object will not be damaged by the strong force of the spray.

③Quick joint spray gun: can easily change the spraying Angle of 0°, 15° 25° 40°, cleaning Angle and low-pressure liquid suction state by changing the 4 nozzles accompanying the gun.

6. Use of cleaning washer



- ① The thread end of the water inlet pipe is screwed to the water inlet of the machine and hardened, and the other end of the water inlet pipe is connected to the filter screen and placed in the water source, and the water source is connected.

⚠ ATTENTION pay attention to the inlet pipe part must be connected tightly and firmly, otherwise the pump may not absorb water due to the inhalation of air.

First switch on the power supply, then open the spray gun trigger hand, and finally open the cleaning washer switch.

After starting the cleaning washer, the air in the pump should be exhausted before cleaning.

When cleaning, the distance between the nozzle and the surface to be cleaned should not be too far, generally not more than 1 meter.


Pressure adjustment: rotate the pressure adjustment handle clockwise to obtain higher pressure, and rotate the pressure adjustment handle counterclockwise to obtain lower pressure. After using the cleaning washer, adjust the pressure adjustment handle clockwise to return it to its original position.

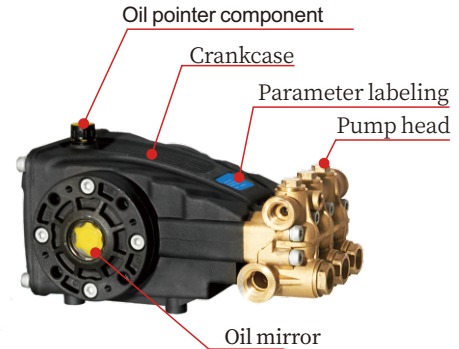
⚠ WARNING the preset pressure of the washing washer can make the washer obtain the optimal water pressure and cleaning function, do not try to increase the pressure, the higher the pressure, the more dangerous the machine will bring

After cleaning, the switch of the cleaning washer should be turned off first, then the water source should be turned off, and finally the spray gun should be turned off, so as to avoid the danger that the outlet pipe and the memory of the spray gun may be hurt by high pressure.

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MAINTENANCE AND WARRANTY

1. SAE 15W 40 or equivalent 4-stroke motorcycle oil can also be used for high pressure pumps in addition to our original "special oil for cleaning machines".
2. After the new machine has been in operation for 20 hours, it is necessary to clean the crankcase of the high-pressure pump. The specific method is as follows: first remove the outer cover according to P5, then remove the oil drain screw of the pump, drain the oil in the crankcase, reinstall the oil drain screw, and add clean lubricating oil to the crankcase. The amount of oil should be slightly greater than the red mark on the oil mirror, and let the pump run without load for 10-15 seconds. After shutting down the machine, completely drain the lubricating oil, Inject new engine oil again.
3. The injection amount of new oil should be just at the center of the red mark on the oil mirror. Cover the panel, install the panel fixing screws and tighten.
4. In the cumulative use of 100 hours to replace the oil in the same way, after every 100 hours to replace the oil once, so to extend the service life of the pump is very important.
5. When the cleaning washer is not used for a long time, the suction pipe and outlet pipe should be removed and the residual water in the pump should be properly placed after exhausting.
6. Should often clean the suction disk, in order to eliminate the pressure caused by the lack of water absorption of the blocked surface of the disk is not enough.
7. Cleaning washer in storage should prevent corrosion and damage, in too cold place storage, should consider appropriate antifreeze measures or antifreeze method, in order to prevent pump parts were frozen crack.
8.  **ATTENTION** after the washer has been used for a long time, please dial the motor impeller under the state of power off before using it again, and finally start the machine.



TROUBLE SHOOTING

TROUBLE	WHY	ELIMINATION METHOD
Motor can't start or stop automatically when running	<ol style="list-style-type: none"> 1. no power supply or poor socket contact. 2. Motor switch is damp or damaged. 3. Low voltage. 	<ol style="list-style-type: none"> 1. Check the power supply and plug it in. 2. Dry or repair. 3. Ask an electrician to check the power grid voltage.
The nozzle does not give water, or the water pressure is unstable	<ol style="list-style-type: none"> 1. The nozzle is blocked. 2. There is air in the pipe. 3. The water inlet pipe breaks. 4. water inlet filter is blocked. 	<ol style="list-style-type: none"> 1. Remove the nozzle and clean it. 2. Check whether the thread of the water inlet pipe is fastened, then fill the water inlet pipe with water, open the spray gun, and start the motor. 3. Replace the water inlet pipe. 4 Clean the filter screen.
The joint is leaking	<ol style="list-style-type: none"> 1. The thread connection is not fastened. 2. The O-ring at the joint is damaged. 3. Quick change connector is not properly inserted. 4. There is no gasket or the gasket is damaged at the threaded connection. 	<ol style="list-style-type: none"> 1. Tighten the threads. 2. Replace the O-ring. 3. Reinsert the quick change connector. 4. Install or renew the gasket.
Crankcase heating up	<ol style="list-style-type: none"> 1. Too much oil. 2. Too little oil causes the connecting rod to bite the shaft. 	<ol style="list-style-type: none"> 1. Drain the excess oil, and the oil level shall be in the center of the red mark on the oil mirror. 2.Remove and repair, remove the bite marks on the connecting rod and shaft.
The pressure is not adjusted	<ol style="list-style-type: none"> 1. The nozzle orifice is too large. 2. Water inlet filter is blocked. 	<ol style="list-style-type: none"> 1.replace the nozzle. 2.clean the filter.
There is no water or water yield is too small	<ol style="list-style-type: none"> 1. The new pump does not absorb water. 2. There are sundries in the pump body. 3. the inlet and outlet water check valve is damaged. 	<ol style="list-style-type: none"> 1. Start the machine and pour water into the water inlet pipe to drain the air inside. 2. repairing. 3. replacement.

MOTOR MAINTENANCE AND REPAIR

1. The use environment should always be kept dry, the motor surface should be kept clean, the air inlet should not be hindered by fiber, etc.
2. When the thermal protection and short-circuit protection of the motor operate continuously, the fault should be found out from the motor or overload or protection device setting value is too low. Only after the fault is removed can it be put into operation.
3. Good lubrication should be guaranteed during the operation of the motor, and grease should be replaced in time when bearing overheating or grease deterioration is found during operation. When replacing the grease, remove the old grease and clean the oil groove of the bearing and bearing cover with gasoline. Then fill 1/2 of the gap between the inner and outer rings of the bearing with ZL-3 lithium grease.
4. When the life of the bearing ends, the vibration motor noise during the operation of the motor will increase significantly. When the ultimate wear clearance of the bearing and radial clearance reaches 0.15mm, the bearing should be replaced.
5. When the motor is disassembled, the rotor can be removed with shaft extension end or non-shaft extension end. If it is not necessary to remove the fan, or it is convenient to remove the rotor from the non-shaft end, the stator windings or insulation should be prevented from being damaged when the rotor is withdrawn from the stator.
6. When replacing the winding, the form, size, number of turns and wire gauge of the original winding must be recorded. When such data are lost, they shall be obtained from the manufacturer. Arbitrarily change the original design windings, often use a motor or several performance deterioration, or even can not use at all.

MOTOR STORAGE AND TRANSPORTATION

1. The motor should be kept dry in storage. Avoid sharp changes in ambient temperature.
2. Storage and transportation should prevent the motor from tipping or inverting.



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