USER MANUAL

Model

BRUMSTYL
B350

HIGH VOLTAGE!

WARNING!

Always call in a qualified electrician to perform service of the electrical system!

INCOMING 5 WIRE TN-S SYSTEM
THE MACHINE IS DELIVERED WITH THIS CONNECTION

INCOMING 4 WIRE TN-C SYSTEM
CONTACT DEALER

USER MANUAL

1 General

1.1 Introduction

The machine is a fan gun for use in dust suppression. With the purpose of binding airborne dust particles and forcing them to the ground, the machine uses a powerful fan and water (under high pressure) to spread a fine water mist. To cover wide areas, the machine can be raised and lowered. It can also rotate.

To ensure that the machine functions optimally and with maximum safety/reliability, it is important that the instructions in this manual are strictly adhered to.

In this user manual, all positions are given as viewed looking in the machine's working direction.

1.2 Safety regulations

Incorrect and/or incautious use of the machine can cause injury or give rise to dangerous situations.

Full understanding of the safety regulations set out below is compulsory. The safety regulations are repeated in section 4, "Handling".

WATER QUALITY. Assure that the water ejected from the machine is not hazardous for people or surrounding environment.

1. The machine can be remotely controlled. Consequently, operation can start up without any preceding warning. Risk of crush injuries!
2. **Keep clear of the air inlet. Fan rotating at high speed. Loose clothing can be drawn into the fan. Risk of serious injury!**
3. Never stand/walk in front of the machine when it is in operation.
4. Always use hearing protection and eye protection when the machine is in operation.
5. To avoid injuries, handle the machine with great care.
6. Use the emergency stop in emergency situations. There is an emergency stop on the electrical cabinet on the left side of the machine.
7. Never point the fan gun at anyone.
8. Do not carry out any maintenance or repairs on/to the machine when it is in operation.
9. Before starting any work on the machine: switch it off; disconnect electricity and water; and, press the emergency stop.

Comment

On delivery of the machine, the owner assumes immediate responsibility for its safety and its safe handling.
Each country has its own safety regulations and laws governing the use of technical equipment and machines. It is the user's responsibility to be fully aware of, and comply with, the relevant laws and regulations. This also applies to local safety regulations. Should the recommendations in this user manual conflict with any safety regulations, laws or ordinances in the user's country or the region where the machine is used, the national and regional laws, ordinances and regulations have precedence.

1.3 CE marking and declaration of conformity

The machine is CE marked. This means that, on delivery, the machine meets the health and safety demands of the EU's machinery directives.

Especially important information is brought to the reader's attention as shown below ("Warning!", "NB!" and "Comment").

WARNING!

"Warning boxes" mark procedures where, to avoid the risk of injury, extra care is required.

NB!

"NB inserts" mark procedures where, to avoid damaging equipment/materials, extra care is required.

Comment

"Comment inserts" mark procedures where, for any other reason, extra care is required.

The user manual is intended for specially trained personnel.

The user manual has the following sections:

1. General
2. Specifications
3. Design and function
4. Handling
5. Maintenance

1.4 Unauthorized modification

The manufacturer accepts no liability for damage or injury caused by unauthorized modification of the machine. Modification is only permitted after written authorization has been received from the manufacturer. Any unauthorized modification is a bar to any claim for damages during the warranty period.

1.5 Maintenance regulations

It is extremely important that maintenance is carried out as per the user and service manuals. The manufacturer accepts no liability for damage or injury resulting from inadequate maintenance of the machine. Inadequate maintenance is also a bar to any claim for compensation during the machine's warranty period.

After any repair, it is important to check that the machine and replaced components work correctly and that there are no leaks.

1.6 Spare parts / Servicing

1.6.1 General

Spare parts must be bought only from manufacturer or on the manufacturer's written recommendation. This is to ensure that spare parts maintain the highest quality. Use of non-approved spare parts voids the warranty.

1.6.2 Ordering information

When ordering, please state your machine's serial number.

1.6.3 Contact details manufacturer

BRUMSTYL
20 RTE D'EPINOUZE
26140 ST RAMBERT D'ALBON
TEL: 04-75-23-27-18
contact@brumstyl.com

1.7 Warranty regulations

1.7.1 General

For a claim under warranty to be accepted, the damaged part must first be evaluated and approved by manufacturer.

The warranty does not apply if the machine has been: used incorrectly and/or incautiously; inadequately maintained; or, fitted with non-approved spare parts.

Please contact us for further details.

1.7.2 Returning parts for a claim

State the machine's serial number and model year. For contact details, see section 1.6.3, "Contact details".

1.8 Updating of user manuals

Manufacturer reserves full rights to make changes in technical data, specifications and user manuals. Every effort has been made to ensure that all information in this user manual is correct. However, manufacturer accepts no liability whatsoever for any errors in the texts or specifications.

2 Specifications

2.1 General

Manufacturer **BRUMSTYL**

Type designation **B350**

2.2 Dimensions and weight

	B350	B450	B600
Length mm	1160	1 160	1160
Width mm	1100	1 100	1100
Height mm	2170	2 170	2170
Weight kg	395	415	445

2.3 Fan

Size	B350	B450	B600
Power kW (motor rating)	5,5	7,5	18,5

Elevation: Min -20°
Max +50°

Rotation: Automatic turning, 10° to 360° in steps of 10°

2.4 Water system

Pump kW	2,2
Required in pressure	2 -12 bar (min flow of 60 LPM)
Water connection	Thread 1" BSP (DN25)
Waterflow	12 – 60 LPM
Water filter size:	300 microns 1"

2.5 Current consumption

Maximum values for current consumption:

	B350	B450	B600
400 VAC / 50 Hz (Amps)	14	19	42
480 VAC / 60 Hz (Amps)		27	

2.6 Electrical connection

	B350	B450	B600
Power connector	16A - 5 pin	32A - 5 pin	63A - 5 pin

B350 B450 B600

2.7 Signs and decals

2.7.1 Signs and decals

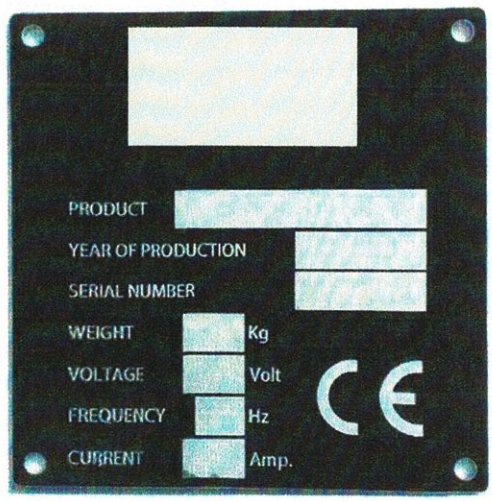


Figure 3: Type plate, machine

Figure 4: Decal on lifting eyes

Figure 5: Decal on fan rotation

2.7.2 Warning signs

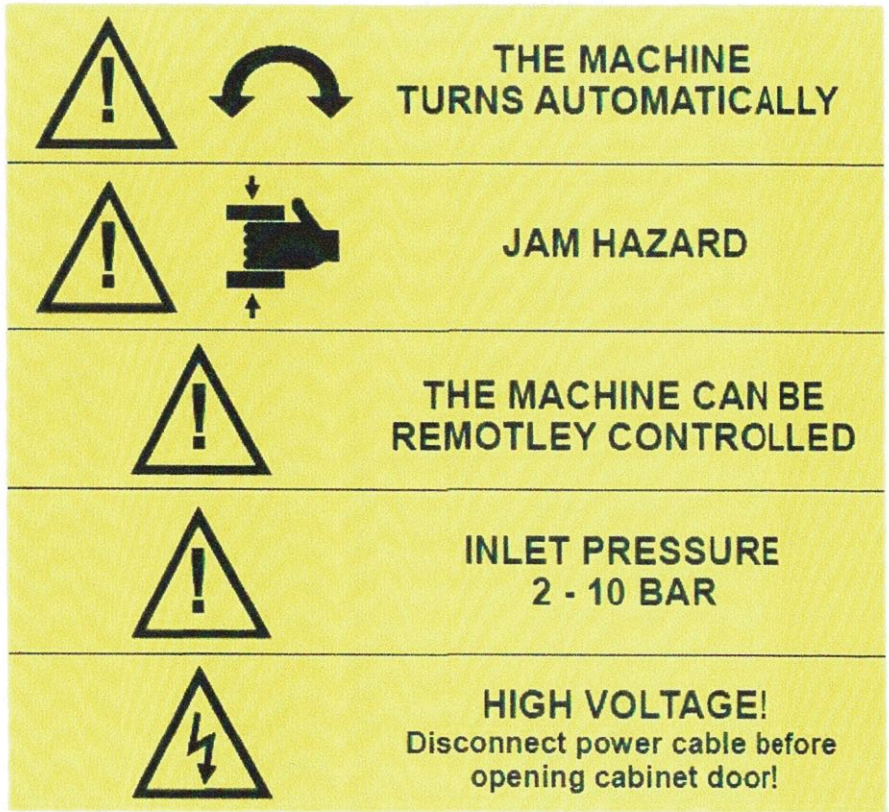


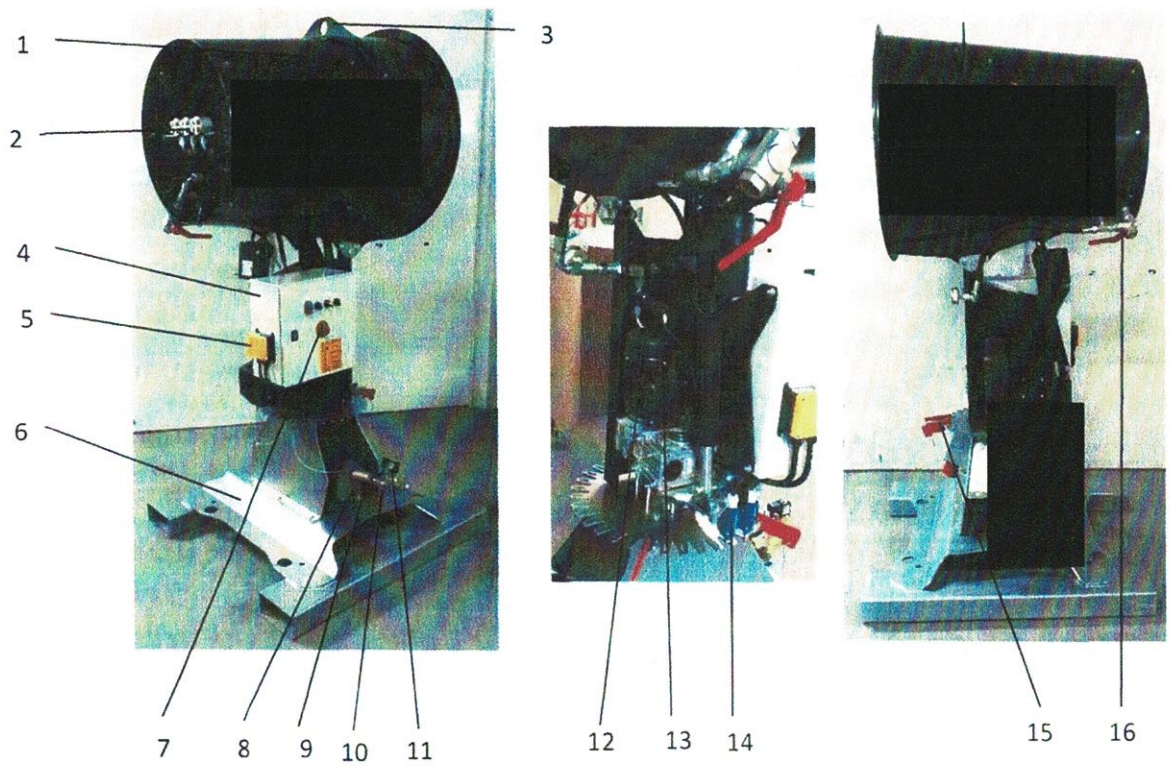
Figure 6: Warning sign on electric cabinet

Figure 7: Warning sign next to nozzle ring (OPTION)

3 Design and function

3.1 General

Via a coupling at the bottom, the machine takes water from an external supply. Through high-pressure hoses, the water is pumped around the system to a nozzle cluster mounted on the front of the gun barrel. This nozzle cluster produces a fine water mist. A fan mounted inside the gun barrel blows the water mist out over the working area. **General illustration, options can occur.**



1. Gun barrel with fan
2. Cluster of water nozzles
3. Lifting eye
4. Electric cabinet
5. Remote base unit
6. Ground chassis with fork adapter
7. Emergency stop
8. Water pump
9. Drain valve
10. Water filter
11. Main water valve
12. Run dry protection (pressure guard)
13. Turning engine
14. Turning sensors
15. Turning control
16. Water stage valve

3.2 Fan gun

The fan gun is mounted on top of a purpose-built steel frame. The gun barrel is steel. On the front of the gun barrel, there is a water nozzle cluster that spread a fine water mist.

In the gun barrel, there is a fan motor that drives a fan. The fan pushes the water mist out over the working area.

Figure: Fan gun

3.3 Water system

3.3.1 General

> **WARNING!**
>
> **Water supply max 10 bars. Risk of damage/injury!**

The water is taken from an external supply and led into the system via a connection in the bottom of the frame.

The machine is equipped with an on-board main valve to shut down the water flow into the machine. The electric valve is automatically opened/closed at start/stop of the fan and water pump.

3.3.2 Water pump

The machine is normally equipped with a water pump. Brand and capacity vary depending on choice made by customer.

See separate documentation for the water pump. This documentation is supplied with the machine.

The machine is equipped with a "dry run protection". This will prevent the pump from running if the water supply is cut.

3.3.3 Water filter

The filter prevents harmful particles and dirt getting into the water nozzles. The water filter's rating is 300 microns.

The filter must be cleaned at regular intervals (see section 5.2.5, "Cleaning the water filter").

Filter options can occur.

3.3.4 Water nozzles

The machine has water nozzles in a cluster at the gun barrel's front opening. Under high pressure they spread a fine water mist.

For cleaning and checking of nozzles, see section 5.2.3, "Checking the water nozzles.

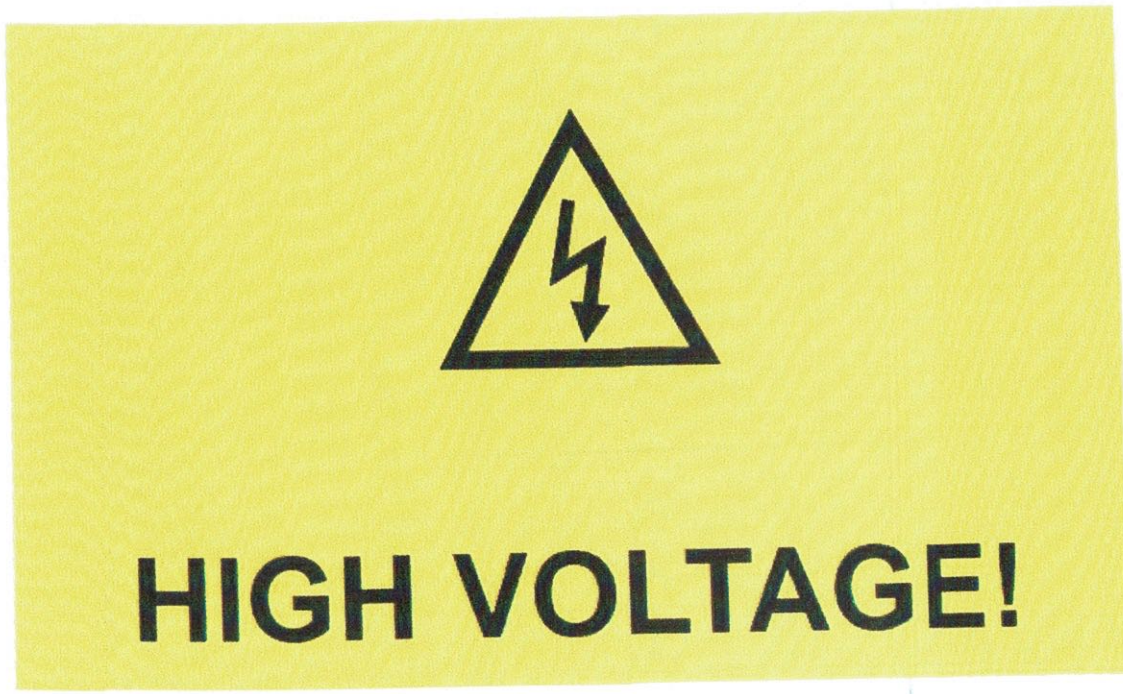
3.3.5 Drain valve

The drain valve at the lowest point of the water system is opened manually after the machine is shut down.

NB!

The drain valves do not drain water from the connection hose. This must be done manually. Risk of damage from freezing in cold weather!

3.4 Electrical systems



WARNING!

Always call in a qualified electrician to perform service of the electrical system!

Tampering with the electrical system without proper knowledge can cause injury or death!

Before starting any work on the machine: switch it off; disconnect electricity and water and press the emergency stop.

3.4.1 General

The machine connects to an external power source via a power cable.

Connection requirements:

B350	400 VAC / 50 Hz / 5 pin / 16 A
B450	400 VAC / 50 Hz / 5 pin / 32 A
B600	400 VAC / 50 Hz / 5 pin / 63 A

Other electrical connections available as option.

3.4.2 Swing

The machine is turned with an electric motor. The motor is placed on the back of the machine. The motor acts on a gearwheel in the middle of the frame. In its turn, this swings the machine to the right and to the left.

3.4.3 Tilt up/down

The machine's gun barrel is tilted up and down by an electrical actuator under the gun barrel.

3.4.4 Electrical cabinet

The electrical cabinet is on the left side of the machine. The electrical cabinet contains relays, circuit breakers, motor protections and contactors.

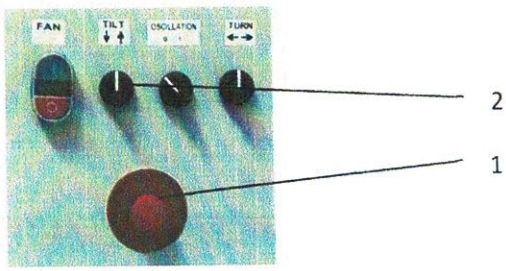


Figure: Cabinet with buttons

1. **Emergency stop button:** Press to stop the machine if there is any danger. To reset, turn the button.
2. Buttons for operation (from left to right):
   - Pump and fan, Start and Stop
   - Tilt, Down and Up
   - Oscillation switch, On and Off
   - Manual turning, left and right

WARNING!

The emergency stop does not cut the power to the cabinet. It cut´s the power to the control circuit!

Before starting any work on the machine: switch it off; disconnect electricity and water and press the emergency stop.

Misusage can cause injury or death!

For detailed description of the components inside the cabinet consult the electric wiring diagram.

3.4.5 Control panel with buttons

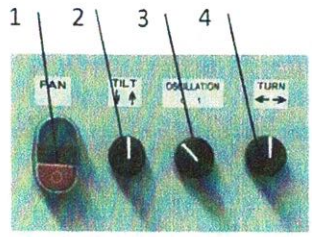


Figure: Panel with buttons

1. Pump and fan
   - START (I)
   - STOP (O)
2. Tilt
   - DOWN
   - UP
3. Oscillation
   - 1 = ON
   - 0 = OFF
4. Manual turning
   - LEFT
   - RIGTH

3.4.6 Remote control (OPTION)

The remote control enables the machine to be controlled from a distance. The remote control's range is 100 meters (50 meters if there are obstacles).

TO ACTIVATE THE REMOTE:

1. Turn on power switch **11**.
2. PRESS button **9 + 10** FOR 2 SECONDS

1. Start button
2. Stop button
3. Tilt gun barrel up
4. Turn to the left
5. Turn to the right
6. Tilt gun barrel down
7. Start automatic swing
8. Extra function
9. Activate remote (button 9 + 10)
10. Activate remote (button 9 + 10)
11. Power On/Off

4 Handling

4.1 Safety regulations

WARNING!

Do not work (or walk/stand) in front of the machine when it is in operation. Keep klear of the air inlet. Fan rotating at high speed. Loose clothing can be drawn into the fan. Risk of serious injury!

WARNING!

The machine can be remotely controlled and operation may thus start up without any preceding warning. Risk of crush injuries!

WARNING!

Do not work on the machine when any part of it is live. Cut off and disconnect the power before starting work in the electrical cabinet. Risk of injury!

WARNING!

Water supply max 12 bars. Risk of damage/injury!

- Use the emergency stop in emergency situations. There is an emergency stop on the electrical cabinet on the left side of the machine.
- Always use hearing protection and eye protection in the vicinity of the machine when it is in operation.
- Hose safety! Take care to ensure that the incoming hose is in good condition and suitable for its purpose. A hose break can cause severe injuries and great damage.
- To avoid injuries, handle the machine with great care.
- Never point the fan gun at anyone.
- Do not carry out any maintenance or repairs on/to the machine when it is in operation.
- Before starting any work on the machine: switch it off; disconnect electricity and water; and, press the emergency stop.

4.2 Warning signs

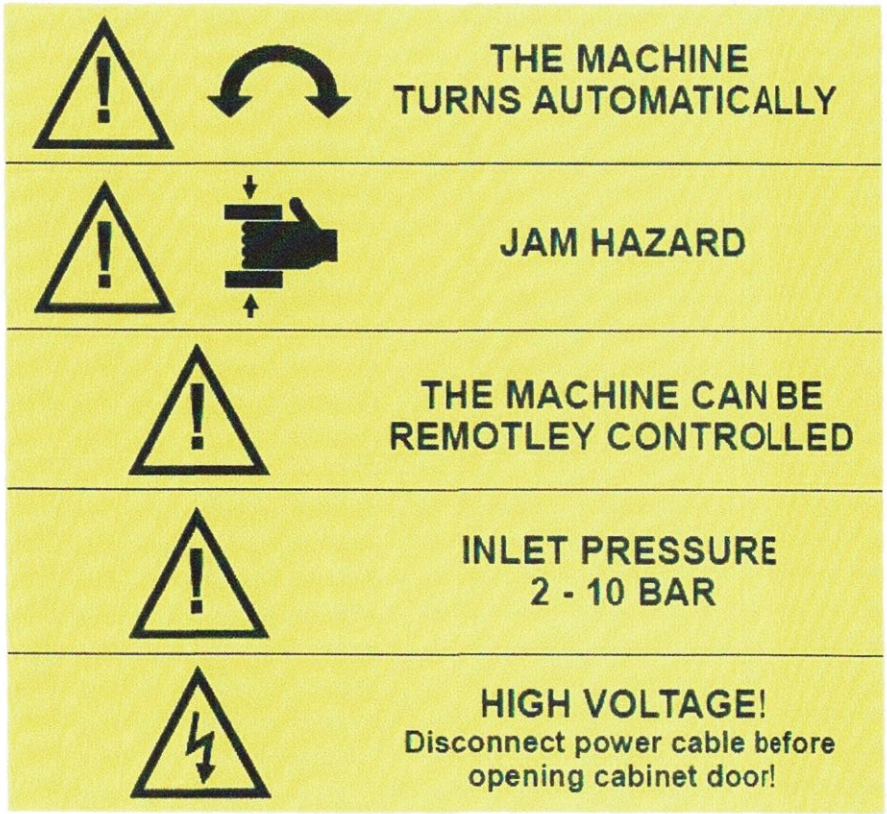


Figure: Warning sign on electric cabinet

Figure: Warning sign next to nozzle ring (OPTION)

4.3 Emergency stop

There is an emergency stop button on the electrical cabinet.

The emergency stop button must only be used to stop the machine if there is any danger.

Figure: Emergency stop button

4.4 Important to bear in mind

The following points must always be borne in mind when handling the machine.

- **IF THE MACHINE DOES NOT HAVE ONBOARD MAIN VALVE:** Even when the pump and fan are switched off, water is continuously moving through the system. The water flow to the machine must be switched off manually via the water tap on the external water supply.
- If active freezing protection (electrical heating) is fitted to the machine, power must be connected and the emergency stop pulled out whenever there is a risk of freezing. This applies even when the machine is not being used.
- If there is a risk of freezing, the connection hose before the swivel must be drained when the machine is disconnected.
- Hose safety! Take care to ensure that the incoming hose is in good condition and suitable for its purpose. A hose break can cause severe injuries and great damage.

WARNING!

Incoming water hose can be pressurized if the machine is equipped with onboard main valve.

This applies when the valve is closed and the machine is not used.

Risk of injury!

4.5 Starting the machine

4.5.1 Preparations

NB!

Before the machine is started, the incoming pressure must be between 2 and 10 bars (max 145 PSI) and the water flow must be sufficient. Risk of damage/injury!

NB!

The machine must be placed on a plan surface. Risk of damage/injury!

Before starting the machine, the following checks must be carried out:

- Check that the fan rotates in the correct direction. If looking from the back, the fan must rotate clockwise. If the fan rotates in the correct direction, then the water pump also works in the correct direction.
- Check that the connecting water hose and power cable are free of damage. If they are damaged, they must be replaced before the machine is started.
- Check that the machine stands firm.

4.5.2-A Starting

WARNING!

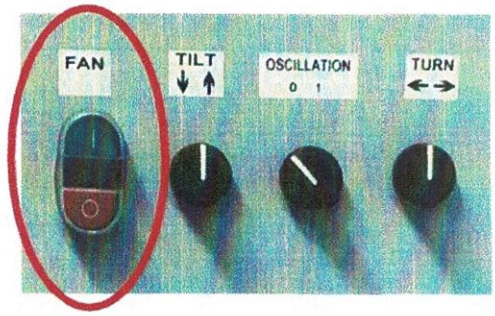
Before starting the machine, ensure that there is no one in front of it. Keep clear of the air inlet. Fan rotating at high speed. Loose clothing can be drawn into the fan. Risk of serious injury!

NB!

Before the machine is started, the incoming pressure must be between 2 and 10 bars (max 10 PSI) and the water flow must be sufficient. Risk of damage/injury!

To start the machine:

1. Connect the water connection to an external water supply.
2. Connect the power cable to an external supply.
3. To start the machine, press the START button for Fan and Pump.



4. When the START button is pressed the fan will start. The pump will start when the pump has water supply.

The gun barrel is stationary and the water mist is spread in the direction that the barrel is pointing. To change gun barrel direction, see section 4.6.4-A, "Manual turning of the machine".

4.5.3 Heating (OPTION)

The machine can be equipped with nose heating or/and hose heating with insulation.

1. Heating

   ON (I)
   OFF (O)

The heating shall be switched of in warm climate (over 0°C).

The heating cable regulate the power output automatically. The colder climate the more power is used.

WARNING!
TURN HEATING OFF in warm climate!
(over 0°C)

Risk of damage/injury!

4.6 During operation

4.6.1 Controlling via the remote control

WARNING!

The machine can be remotely controlled and operation may thus start up without any preceding warning. Risk of crush injuries!

The remote control offers the same machine control possibilities as the buttons on the electric cabinet.

The remote control's range is 100 metres (50 metres if there are obstacles). For more information about the remote control, see section 3.4.7, "Remote control".

4.6.2-A Starting and stopping automatic swing

The machine can be run with automatic oscillation. This means that the machine swings back and forth within a predetermined arc.

To activate automatic oscillation, turn the switch to **1**.

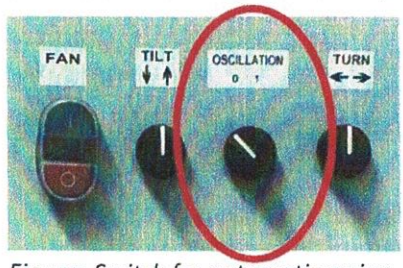


Figure: Switch for automatic swing

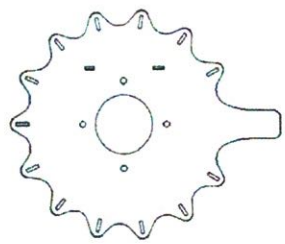
A. OSCILLATION
   1 = ON
   0 = OFF

The machine now starts to oscillate in accordance with the turning settings (right limit and left limit).

To stop automatic oscillation, turn the switch to **0**.

4.6.3-A Setting swing area

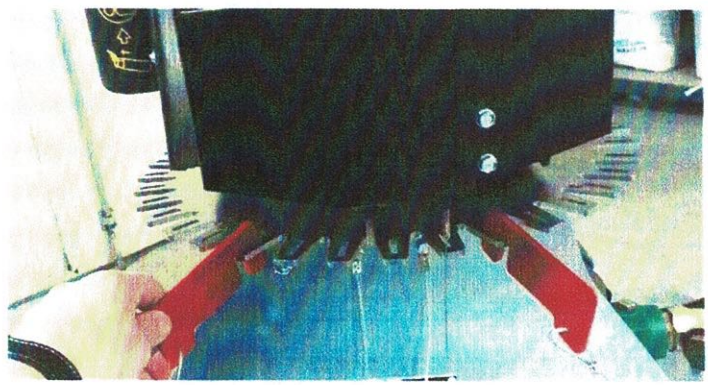
The swing area is controlled by 2 mechanical limits switches mounted on the machine tower under a cover. The area is adjusted by moving turn stop plates to different positions at the swing plate.



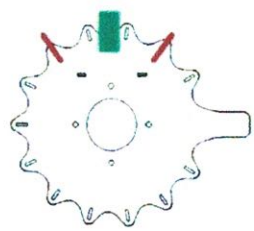
Swing plate

Turn stop plate

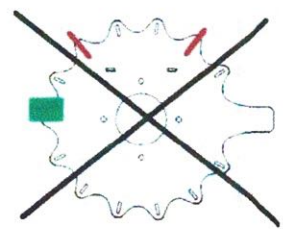
The turn area can be set in steps of 10 degrees. Minimum swing arc is 10 degrees and maximum 360 degrees. The swing plate has a fixed turn stop that prevents the machine from turning more than 360 degrees. The fixed turn stop can also be used as turn stop for the turn area (in this case only one turn stop plate is used).



Before setting the turn area make sure that turning, water and fan is turned off. Set the turning area by placing the turn stop plates at the borders of the required turn area. The machine's working direction must be inside the turning area when setting the borders.



Limit switches inside turning area.



Limit switches outside turning area.

4.6.4-A Manual turning of the machine

To use manual turning automatic swing must be turned off. See 4.6.2-A.

Use the arrow switch to manually turn the machine to the right or to the left.

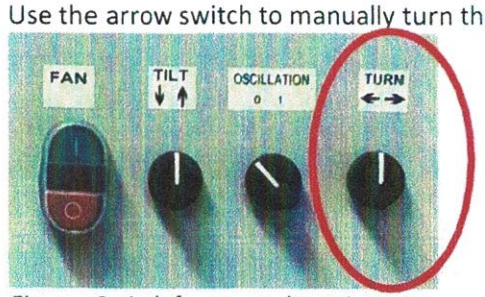


Figure: Switch for manual turning

The machine swings in the selected direction. The turning is limited by the settings for the automatic turning.

4.6.5 Tilting the gun barrel up or down

The gun barrel can be tilted between -10° and +50°.

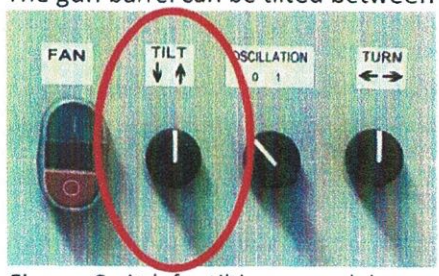


Figure: Switch for tilting up and down

The switch tilts the gun barrel up or down throughout the time it is held.

4.6.6 Measures in the event of faults

Below, there is a table of the most common problems during operation. If a fault persists, contact support.

Problem	Cause	Measure
Nothing happens when buttons are pushed.	No power to the machine.	Connect power cable. Pull out emergency stop. Check that white light is shining.
Fan, pump, swing or other function not working.	Fuses and/or motor protection have tripped.	Check fuses and motor protection. Re-set!
Water poor out from the drain valves during operation.	To low in-pressure/flow. Dirty drain valves.	Ensure proper pressure/flow. Clean the drain valves.
No water sprayed.	To low in-pressure/flow. Hose not connected. Water system frozen. Dirty water filter.	Ensure proper pressure/flow. Check that the water hose is correctly connected. Thaw with a heat gun. Clean the water filter.
Poor performance.	Phase fault, fan rotating in wrong direction.	Using a phase shifter, switch phases in the plug. If looking at the fan from the back, the fan must rotate clockwise.
Abnormal noise and/or vibrations.	Fan damage.	Replace fan immediately.
Turning not working despite turning button activated	IMP relay.	Open the electric cabinet and press the button on the relay marked IMP.

5 Maintenance

5.1 General

To ensure that the machine functions optimally and with maximum safety/reliability, the maintenance regulations must always be followed.

Maintenance is divided into daily and annual maintenance (see the separate maintenance chart). The maintenance chart follows the regulations in this section.

> **WARNING!**
>
> **Before carrying out any work on the machine: switch off the machine; push in the emergency stop; and, always remove the power cable and water hose. Risk of injury!**

> **WARNING!**
>
> **Under no circumstances whatsoever is maintenance to be carried out on the machine while it is in operation. Risk of injury!**

> **WARNING!**
>
> **Shut off the water supply before opening the water filter. Risk of injury!**

> **WARNING!**
>
> **Do not work on the machine when any part of it is live. Cut off and disconnect the power before working in the electrical cabinet. Risk of injury!**

5.2 Water system

5.2.1 Checking the water system

- Check all water hoses and all couplings for leaks.
- Check the on-board main valve.
- Check that the drain valve works correctly (see section 3.3.7, "Drain valve").

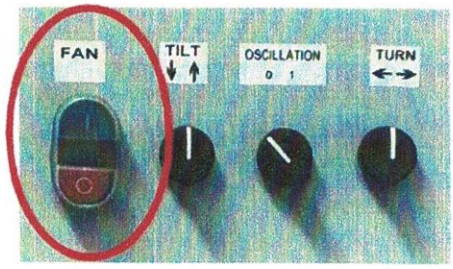
5.2.2 Checking the water pump

See separate documentation for the water pump. This documentation is supplied with the machine.

4.7 Stopping the machine

4.7.1-A Stopping the machine (panel with buttons)

To stop the machine, press the STOP button for Fan and Pump.



A. Fan and Pump
START (green I) button
STOP (red O) button (water valve will close)

The water pump and fan will switch off.

THE MACHINE CAN ALLWAYS BE EMERGENCY STOPPED FROM ELECTRIC CABINET AND REMOTE CONTROL!

4.7.2 Measures after operating

To prevent freezing, the connecting hose must be drained of water after each period of operation. This must be done manually.

The machine's drain valve must be opened to drain water from the rest of the system.

Disconnect the power cable and the connected water hose.

NB!

The water flow to the machine must be switched off manually via the water tap on the external water supply.
The machine is equipped with on board valve.

NB!

If the machine has active freezing protection (electrical heating), power must be connected and the emergency stop pulled out if there is a risk of freezing. This applies even when the machine is not being used.

5.2.3 Checking the water nozzles

When working correctly, the water nozzles produce a strong, finely dispersed water mist.

If a problem arises, first check that the nozzles are not clogged. Check also that the water hoses and the water nozzle connections are not damaged or leaking.

5.2.4 Cleaning and replacing water nozzles

The procedure is the same whether cleaning or replacing water nozzles.

1. Remove the nozzle that is to be cleaned or replaced.
2. Use compressed air to clean the nozzle. Check that the nozzle is not damaged. If it is damaged, it must be replaced before the machine is used again.
3. Screw back the nozzle. Torque tightening is not required.

5.2.5 Cleaning the water filter

The machine is equipped with a filter. The filter shall be cleaned according the instruction below when needed.

> **WARNING!**
>
> **Shut off the water supply before opening the water filter. Risk of injury!**

If the water filter is clogged or dirty, clean as set out below. Some filter models can be flushed during operation but needs to be cleaned as instructed below from time to time depending of water quality.

1. Turn the filter cap anticlockwise to unscrew it from the filter holder.
2. Remove the filter.
3. Lower the filter into tepid water that contains a little mild detergent. Clean the filter.
4. When the filter is clean, rinse it with hot.
5. Before putting it back into the filter holder, check that the filter is undamaged. If the filter is damaged, it must be replaced.
6. Refit the filter.
7. Screw the cap back.

5.3 Electrical systems

5.3.1 General

> **WARNING!**
>
> **Do not work on the machine when any part of it is live. Cut off and disconnect the power before starting work in the electrical cabinet.**
>
> **Risk of injury!**

It is important to check ALL electrical equipment (outside and inside the electrical cabinet) (also all cables) every year or every 500 operating hours (whichever comes first).

5.3.2 Checking the connection cable

- The connection cable must be free of damage. If there is damage, the cable must be replaced immediately.
- Check contact pins for damage. If any pin is damaged, it must be replaced immediately.

5.3.3 Checking the electrical cabinet

- Check that there are no loose cables or loose screws in the electrical cabinet. Tighten any loose screws and attach any loose cables.
- Check that the cabinet's door can be closed and locked.
- Check that the warning sign on the electrical cabinet's door is in good condition. If the sign cannot be read, it must be replaced immediately.

5.3.4 Checking buttons/switches function

- Check that the buttons/switches works correctly and responds when activated.

5.3.5 Checking the emergency stop function

> **WARNING!**
>
> **If the emergency stop button is not working, the machine must not be started before the fault has been corrected. Risk of injury!**

Check that the emergency stop button works correctly. Start the machine and then press the emergency stop. The machine must shut down immediately. Reset by turning the button. If the emergency stop button is not working, contact support immediately for assistance. The machine must not be run if the emergency stop button is not working. Also test the function of the emergency stop on the remote control according to previous routine.

5.3.6 Checking the heatingcable (OPTION)

Check that naked heating cables are free from damages. If the machines is equipped with hose heating with insulation, check that the insulation is free from damages. If there are damages on the insulation it must be removed and the heating cable must be checked.

DAMAGED HEATING CABLE MUST BE CHANGED! THE MACHINE CAN NOT BE POWERED UP IF ANY OF THE HEATING CABLES ARE DAMAGED!

5.4 Frame and fan

5.4.1 Checking the frame

Check that none of the frame's screws and nuts has come loose. Tighten any loose screws and nuts. A torque spanner is not required.

5.4.2 Checking the fan and gun barrel

Check the inside of the gun barrel for wear and damage. Wear and damage can reduce efficiency.

Check that the fan blades are undamaged. Damage to fan blades can reduce efficiency. If fan blades are damaged, they must be replaced.

5.4.3 Checking turn and tilt functions

Check that the machine's turn and tilt functions are working correctly. Start the machine and carry out the checks via the control panel. If the machine has remote control, functions must also be tested via this.

5.5 Troubleshooting

A table of the most common faults and measures is given below.

Problem	Cause	Measure
Nothing happens when buttons are pushed.	No power to the machine.	Connect power cable. Pull out emergency stop. Check that white light is shining.
Fan, pump, swing or other function not working.	Fuses and/or motor protection have tripped.	Check fuses and motor protection. Re-set!
Water poor out from the drain valves during operation.	To low in-pressure/flow. Dirty drain valves.	Ensure proper pressure/flow. Clean the drain valves.
No water sprayed.	To low in-pressure/flow. Hose not connected. Water system frozen. Dirty water filter.	Ensure proper pressure/flow. Check that the water hose is correctly connected. Thaw with a heat gun. Clean the water filter.
Poor performance.	Phase fault, fan rotating in wrong direction.	Using a phase shifter, switch phases in the plug. If looking at the fan from the back, the fan must rotate clockwise.
Abnormal noise and/or vibrations.	Fan damage.	Replace fan immediately.
Turning not working despite turning button activated	IMP relay.	Open the electric cabinet and press the button on the relay marked IMP.