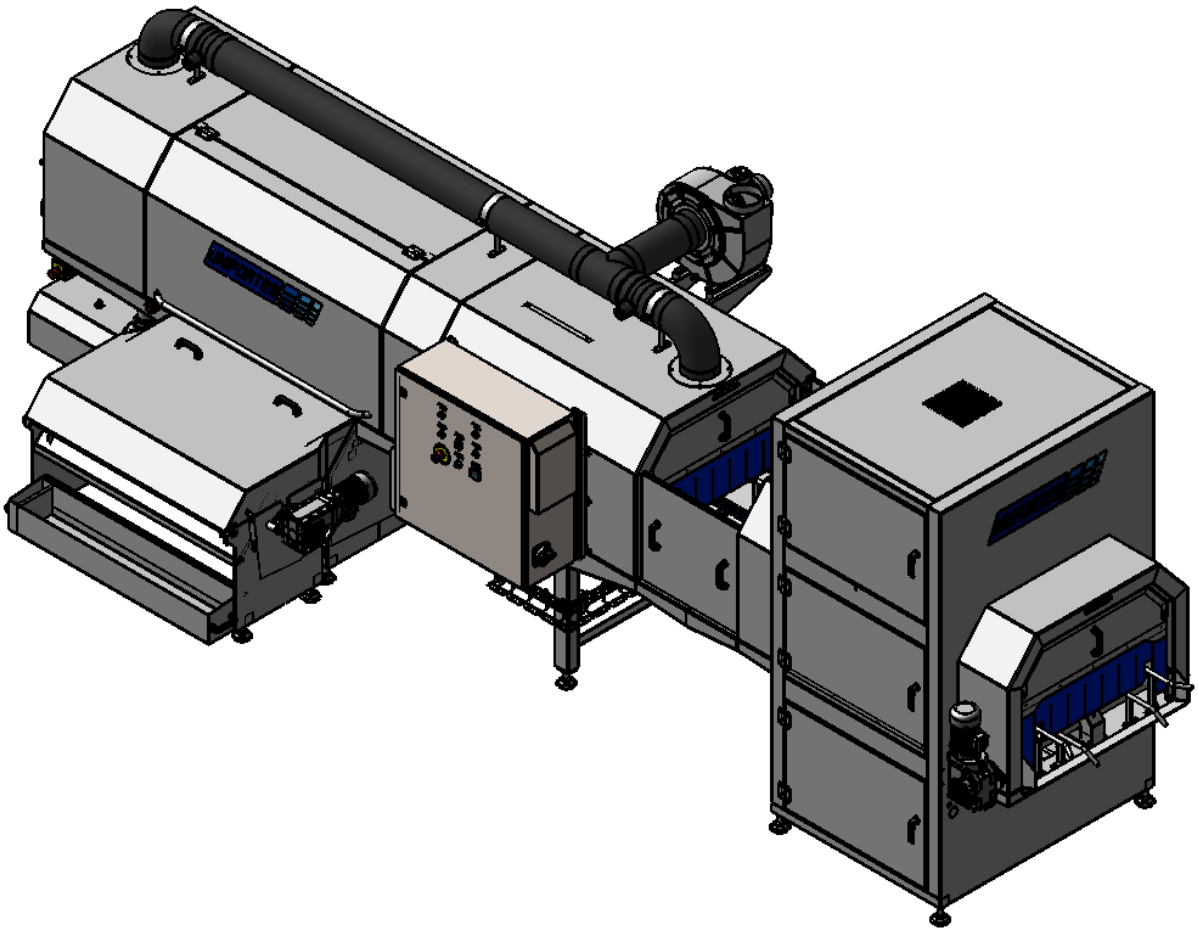
UNIFORTES
INDUSTRIAL CLEANING SYSTEMS & LOGISTICS



Industrial washer manual

Version 1.0

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Foreword

This user manual describes operation, maintenance and safety precautions for the industrial washing line. This user manual is intended for the operation and maintenance of the machine.

Precautions and safety instructions in this user manual are in **bold** formatting, and are accompanied by a safety or warning symbol adjoining the paragraph.

To avoid any risk, injury or damage, please read this user manual thoroughly before commissioning the machine.

The content of this user manual must not be construed as a guarantee that the machine cannot cause any injury or damage, even if the safety instructions are strictly observed.

This user manual is part of the customer file which is supplied with the installation and may contain documents providing additional information such as a layout, electrical documents and spare parts lists.

This user manual has been prepared on the basis of Dutch standard NEN 5509:2016.

Since Unifortes B.V. makes machines that are custom build to the customer's requirement. The illustrations in the manual may vary slightly. The manual is prepared with utmost diligence to avoid such confusions. Please feel free to contact Unifortes B.V. in case of any queries.

If you have any questions regarding the industrial washing line, please contact:

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Table of contents

1. Description of the machine line

The industrial washing series is designed for the washing and drying of many different products. Although it's very versatile its configured specifically for the product(s) of the customer and only meant to wash these.

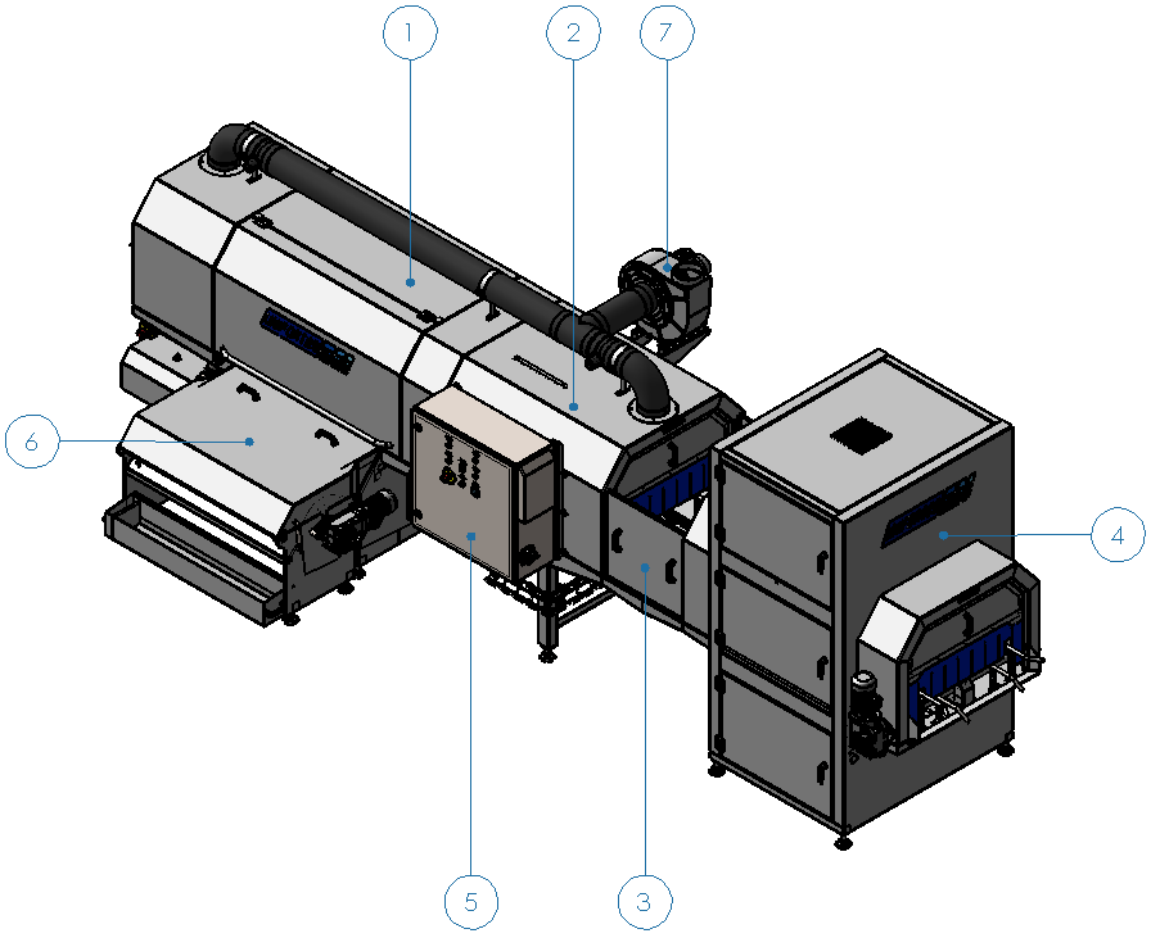
1.1. Module description

Unifortes industrial washers and blow-off modules are designed to be modular and therefore can be supplied in many different configurations. The wash module, rinse module and control cabinet are standard. All other modules are optional and can be added. The following installation is just an example of a possible configuration and may not match the specific installation supplied:

Example modules:

1. Wash module
2. Rinse module
3. Transition table*
4. Blow-off module*
5. Control cabinet
6. Drum filter*
7. Vapour extraction*

**Optional*



There are several other modules that can be added to an installation. All of these other modules are optional and need to be picked by the customer.

Other modules:

- Infeed looping
- Infeed table
- Extra wash module(s)
- Extra blow-off module(s)
- Outfeed table
- Gravity turner
- Cloth filter
- Compact belt filter

1.2. Description of the modules

For every module there will be a description about its purpose and about the key parts it contains.

1.2.1. Wash module

The wash module is a washing tunnel where the product will be washed by the main spraying rack.

Wash module contains the following key parts:

- Reservoir
- Pump
- Filters
- Spraying rack with nozzles
- Transport system
- Sensors
- Water/steam valves

1.2.2. Rinse module

In the rinse module the product will be rinsed by a small spraying rack with fresh water.

Rinse module contains the following key parts:

- Spraying rack
- Geared motor (in case of no blow-off or outfeed table)
- Water/steam valves
- Transport system

1.2.3. Transition table

The transition table is used as a connection between the washer and the blow-off. Here the product can drip a bit before it gets transported to the blow-off.

Transition table contains the following key parts:

- Transport system

1.2.4. Blow-off module

In the blow-off module the product will be dried by blowing air on the product. This way the water will be blown off the product.

Blow-off module contains the following key parts:

- Transport system
- Centrifugal fans
- Air knives
- Geared motor (in case of no outfeed table)

1.2.5. Control cabinet

The control cabinet is used to control the machine and contains all of the electrical parts regarding to controlling the installation.

Control cabinet contains the following key parts:

- Electrical components (relays, fuses, etc.)
- Buttons
- Lights

1.2.6. Drum filter

A drum filter is a module that filters the water that comes out of the wash module to remove the dirt and prevent damage to the pump due to dirty water. The drum has narrow holes through which water can pass through, but dirt cannot.

Drum filter contains the following key parts:

- Geared motor
- Drum
- Scraper

1.2.7. Vapour extraction

The vapour extraction is placed on top of the washer to extract the vapour on the inside and prevent the forming of vapour clouds.

Vapour extraction contains the following key parts:

- Electric motor

1.2.8. Infeed looping

The infeed looping turns products around before they go into the washer by letting them fall through a looping using gravity.

Infeed looping contains the following key parts:

- Transport system
- Pneumatic parts

1.2.9. Infeed table

The infeed table transports the product to the washer.

Infeed table contains the following key parts:

- Transport system

1.2.10. Extra wash module(s)

An extra wash module can be placed in front of the standard wash module to improve the washing result and/or the capacity of the installation.

An extra wash module contains the following key parts:

- Reservoir
- Pump
- Filters
- Spraying rack with nozzles
- Transport system
- Sensors
- Water/steam valves

1.2.11. Extra blow-off module(s)

Extra blow-off module(s) can be added to the installation to improve the drying result and/or improve the capacity of the installation.

An extra blow-off module contains the following key parts:

- Transport system
- Centrifugal fans
- Air knives

1.2.12. Outfeed table

The outfeed table transports the product out of the machine.

Outfeed table contains the following key parts:

- Transport system
- Geared motor

1.2.13. Gravity turner

A gravity turner turns the products at the end of the installation to make it easier to take out and prevents water getting stuck in certain spaces. It makes use of gravity to turn the products

A gravity turner contains no key parts, but is part of the outfeed table.

1.2.14. Cloth filter

A cloth filter is a module that filters the water that comes out of the wash module to remove the dirt and prevent damage to the pump due to dirty water. It contains a drum with a cloth attached to it. This cloth filters the water and the dirt will remain in the drum and be transported outside of the cloth filter.

Cloth filter contains the following key parts:

- Geared motor
- Drum
- Cloth
- Water/steam valves

1.2.15. Compact belt filter

The compact belt filter is a module that filters the water that comes out of the wash module to remove the dirt and prevent damage to the pump due to dirty water. The paper filters the water from sand and other dirt and transports it out of the filter.

Compact belt filter contains the following key parts:

- Geared motor
- Paper roll
- Belt

2. Technical specifications

In this chapter there will be given an overview of the technical specifications of the installation.
These technical specifications will differ for every installation.

Project number:	621537
Installation type:	UNI-W350.100H + UNI-D200.100
Length:	10400mm
Width:	3100mm
Height:	2200mm
Mass:	2500kg
Transport direction:	Left to right
Capacity:	2x500 products/hour
Product dimensions:	600 x 400 x 70mm 600 x 400 x 325mm 600 x 400 x 270mm
Electrical connection:	400V - 3Ph + 0 + Earth - 50Hz
Electrical power:	80kW

3. Precautions and safety instructions

This chapter concentrates on machine safety. There are warnings about potential hazards, and precautions required to be followed before putting the machine into service. Operators should know the general safety rules and what the hazard zones of the machine are.

3.1. Key symbols

The following list contains key symbols which are important to know regarding the machine.

	Risk of entanglement between chain and sprockets.
	Risk of pinching between the doors.
	Risk of slipping due to wet floor.
	Hot surface, liquids and steam hazard.
	Caution! Observe the stated warning!
	Use measuring tool for the stated operation.
	Inspection by ear.
	Visual inspection.
	Foot protection: This symbol makes it imperative for the user to wear safety shoes.
	Ear protection: This symbol makes it imperative for the user to wear ear protection.
	Eye protection: This symbol makes it imperative for the user to wear safety goggles.
	Hand protection: This symbol makes it imperative for the user to wear protective gloves.

3.2. General safety and precautions

General safety and precautions should always be kept in mind while working around the machine. This is to ensure the safety of all people working around the machine.



- Trapping hazard between product and machine. Do not stand or sit in the machine when in operation.
- Trapping hazard between parts powered by motors and cylinders.
- Slippery hazard around the machine because of wet floors.
- Burn hazard around the machine. Do not reach into the machine when in operation.
- Ensure sufficient clearance for moving parts when machine is or could be in operation.
- Use products intended for this machine only.
- Ensure that the main switch is turned off for maintenance or parts replacement.

- Ensure that the cables for the machine are not damaged.
- In-case of damaged cables immediate replacement is necessary.
- Maintain proper work dress code to prevent pinch or trap hazard.

3.3. Hazard zones of the machine

This section examines the various components of the machine, showing the potential hazards and risks in each component. Most hazard zones are protected by safety provisions. Only safety provisions which do not cause a problem for the functionality of the machine have been made.

3.3.1. Product infeed and outfeed

Risk of entrapment

- The zone of infeed and outfeed are a high risk trapping zones.
- Avoid the chain and sprockets when the machine is in operation.

Risk of burn

- The zone of infeed and outfeed are a high risk of burn zone due to hot washing water.

3.3.2. Washing module

Risk of pinching

- The doors are a high risk pinching zones. Watch out for hands getting pinched by the door when closing.

Risk of burn

- The zone of wash and rinse module are a high risk of burn zone due to hot washing water.
- The doors are a high risk of burn zones.
- Don’t open the doors while the machine is in operation. Hot water will splash out.

3.3.3. Drum filter

Risk of entanglement

- The drum filter is a high risk entanglement zone.
- Avoid the shaft and drum when the machine is in operation.

Risk of pinching

- The cover of the drum filter is a high risk pinching zone. Watch out for hands getting pinched when closing the cover.

Risk of burn

- The drum filter is a high risk of burn zone.
- The cover needs to be able to open during operation. When open during operation hot water will run through the drum filter.

3.3.4. Infeed looping

Risk of pinching

- The infeed looping is a high risk pinching zone. Watch out for hands getting pinched by the crates when they come down the looping.

3.4. Safety provisions

To ensure safe operation of the machine so that you, as end user, and your visitors, our service personnel, etc. are not exposed to any danger, the machine is equipped with several safety provisions.

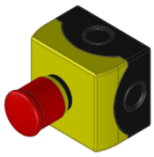
Unifortes recommends that you test all safety measures at least once a year. If an emergency stop of the machine is not triggered immediately during a test (an emergency stop is indicated by the red lamp on the switch box), you must clearly indicate on the machine that the safety provision concerned is defective and contact Unifortes as soon as possible.

3.4.1. Safety switches

The doors in the machine are protected by a safety switch. Safety switches are components that monitor a door's status. The moment the door status changes (in this case when the door is opened), the door switch sends a signal that causes an emergency stop of the machine.

3.4.2. Emergency stop buttons

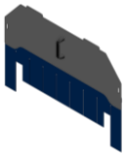
Emergency stop buttons are not primary safety measures, but are still part of the functional safety measures. Because they are only pressed when an accident or damage is imminent or has already occurred.



Emergency stop buttons are red buttons. When pressed they stop the machine line as quickly as possible.

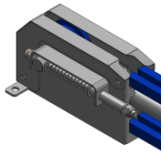
Emergency stop buttons are placed at or near all operator workplaces.
The emergency stop buttons are only intended for use in an emergency. Frequent use can cause premature wear of machine parts.

3.4.3. Doors and covers



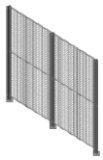
Fixed doors and removable covers are placed at multiple positions around the machine. These doors and covers contribute to the safety of the machine in two ways. First they keep hot water from splashing out of the machine. Second they prevent people from sticking their arms into the machine.

3.4.4. Transport chain/belt covers



Over the chain/belt sprockets there is a cover in place to prevent the entrapment of fingers. It is not possible to fully hide away the chain/belt sprockets due to functionality reasons, but are hidden away enough to prevent any accidental entrapment.

3.4.5. Fencing



Safety fencing can be placed around the installation. This is to prevent the operators, that are working around the machine, from getting near dangerous areas of the installation during operation.

3.5. Personal protective equipment

This section specifies the personal protective equipment (PPE) the user of the installation must wear to ensure maximum protection against the risks posed by the installation.

3.5.1. Mandatory personal protective equipment

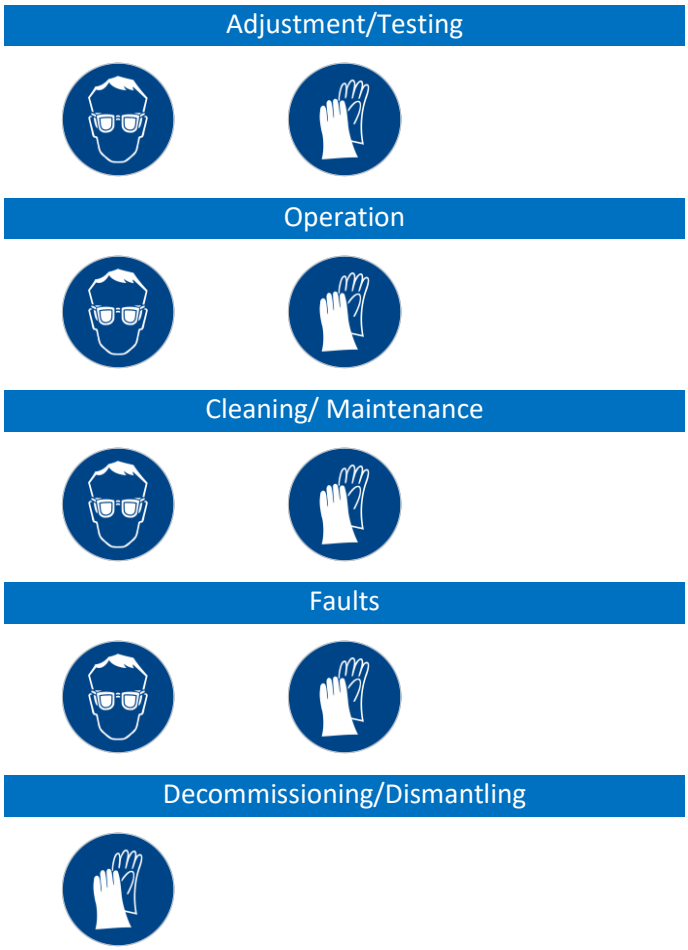
In the following cases it is mandatory to wear personal protective equipment:

Transport			
Installation			
Adjustment/Testing		*	
Operation		*	
Cleaning/ Maintenance			
Faults			
Decommissioning/Dismantling			

* The noise levels are highly dependent on the machine and the room it is placed in. If the noise exceeds 70 dB the wear of ear protection is mandatory

3.5.2. Extra personal protective equipment for chemicals

In the case of chemicals being added to the water in the machine, there is need for extra personal protective equipment. The following personal protective equipment should be worn on top of the already mandatory personal protective equipment.



4. Working and operation

In this chapter there will be a short description about the operation and the process the product will go through. Furthermore every operator should know how to control the installation.

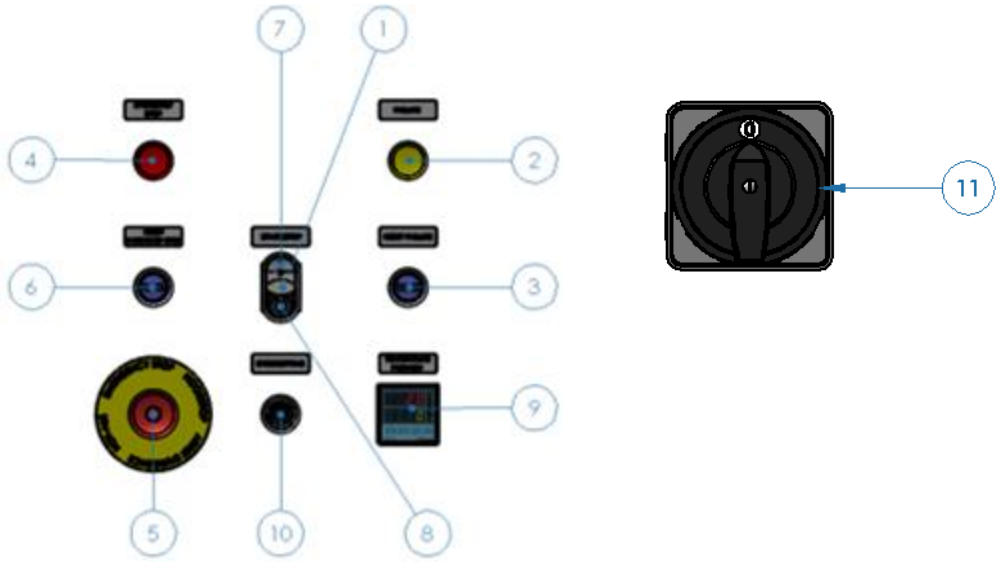
4.1. Working of the machine

- Infeed the product.
- The transport system starts and takes the product through the installation.
- The product gets washed in the wash module.
- The product gets rinsed in the rinse module.
- The product gets transported to the blow-off module through the transition table.
- The excess water gets blown off the product by the blow-off(s).
- Take the product out of the machine.

4.2. Control panel

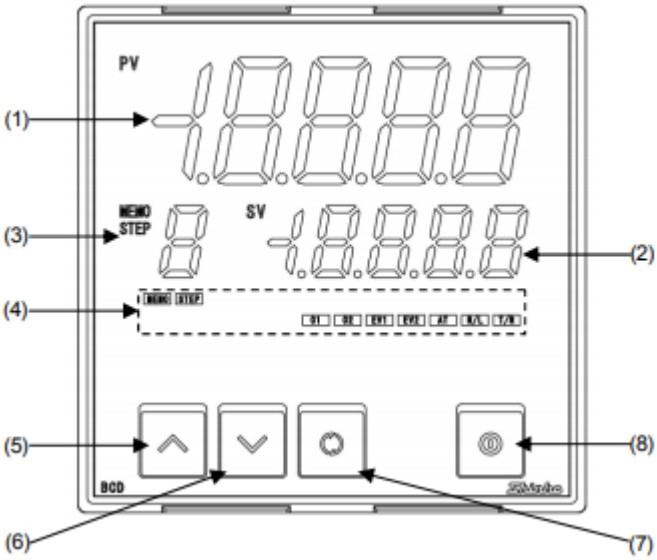
The machine has to be controlled by the buttons on the control cabinet on the machine. The machine should be prepared properly before use.

4.2.1. Control cabinet



Button/light	*Function*
1. Green light	Flashing indicates that the machine is filling up. When the light is on the machine is ready for use.
2. Yellow light	Indicates a failure.
3. Reset failure button	Push button to reset failure, only works if failure is resolved.
4. Red light	Indicates an emergency stop
5. Emergency stop button	Push button to activate emergency stop.
6. Emergency stop reset button	Push button to reset emergency stop, make sure no emergency stop button is still activated before reset.
7. Start button (“I”)	Push button to start the machine.
8. Stop button (“O”)	Push button to stop the machine.
9. Temperature main wash display	Set the water temperature.
10. Potentiometer	Turn clockwise to increase transport speed. Turn counterclockwise to decrease transport speed.
11. Main switch	Turn the power of the machine on or off

4.2.2. Temperature display



Button/display	*Function*
1. Process variable display	Indicates the current temperature. Display setting characters in setting mode.
2. Desired value display	Indicates the desired temperature. Display set data in setting mode.
3. MEMOSTEP display	Indicates the set value memory number or Step number.
4. Action indicator	Indicates the mode of the temperature display.
5. UP button	Increases the numeric value. If this key is pressed for 1 second during program operation, the unit proceeds to the next step (Advance function).
6. DOWN button	Decreases the numeric value.
7. Mode button	Selects the setting mode, and registers the set data. In RUN mode, if this key is pressed for 3 seconds, the unit moves to Monitor mode.
8. OUT/OFF button	OUT/OFF function: Turns the control output ON or OFF. Auto/Manual control: Switches the Auto/Manual control. Program control: Starts or stops the Program control.

4.3. Operation of the machine

Every operator should know what he needs to do to operate the installation in a proper and safe way.
It is important that every operator will read and understand the following process in this paragraph

4.3.1. Before operating the machine

Make sure to follow every point of the following checklist before operation of the machine can be started:

- Both filter trays should be in place in the reservoir.
- All hatches and doors need to be closed.
- Fill the reservoir with water.
- The rinsing water valve should be connected and the valve opened.
- The main switch should be set to “ON”.
- Make sure the water temperature and transport speed are set correctly on the control cabinet.
- Get the water up to temperature before washing.
- There should be no errors showing on the control cabinet.

After all these points are checked off the machine is ready for operation.

4.3.2. How to operate the machine

To operate the machine follow these steps:

- When the water temperature reaches the set temperature.
- Start the pumps by pressing the start button.
- The water temperature will now likely drop some degrees, so wait for the water temperature to stabilize again at the set temperature.
- The conveyor will start after a short while and the machine will be ready for products to be inserted.
- At the end of operation press the stop button to turn off the machine.

4.3.3. After operating the machine

After operation always make sure the following list is checked:

- Switch off the main switch.
- Close the water supply valves.
- Close the heating valves.
- After waiting at least 10 minutes, open the water drain valve of the wash tank. These 10 minutes are necessary to let the heating elements cool down so they won’t be burned.

4.4. Cleaning mode

In the cleaning mode the washing machine can be cleaned while the hatches are open. This cleaning mode will be available when a external drum filter is used. The chain transport system and external filter are running on a slow speed, so they can be properly cleaned.

4.4.1. Safety precautions

When the cleaning mode has been activated the hatches of the wash sections can be opened.

Caution! Please be aware the safety sensors on the doors are deactivated! All emergency stops are still in operation and can be used when there will be a hazardous situation!

4.4.2. Activating the cleaning mode

The supervisor is in possession of a key which to activate the cleaning mode on the switchbox. Please check and do the following steps before activating the cleaning mode.

- Check if all emergency stops and errors are being reset on the switchbox.
- Put in the key to the switchbox and turn it from “0” to “I”.
- Press on the start button “I”.
- Open the hatches from the wash sections.

The chain transport and drum filter will start to run at a slow speed and the cleaning mode will be activated, after a certain time the machine will automatically stop running the chain and drum filter.

4.4.3. Deactivating the cleaning mode

Please check and do the following steps before activating the cleaning mode.

- Press on the stop button “0”.
- Turn the key on to the switchbox from “0” to “I”.
- Take out the key from the switchbox and give it to the supervisor.

To proceed the normal operation of the machine please do the following steps.

- Close all hatches of the wash sections.
- Check if all emergency stops and errors are being reset on the switchbox.
- Turn on the machine by pushing the start button on the switchbox.

5. Maintenance and repair

This chapter describes the maintenance of individual parts and elaborates on how to repair these specific problems. In some cases the parts will become too severely damaged so they will have to be replaced completely.

5.1. Pumps

5.1.1. Centrifugal

There's no lubrication required on the pumps, but several factors affect pump performance. Centrifugal pumps are ideal to use for the normal spraying racks in Unifortes installations. Centrifugal pumps have a low pressure, but can pump a high capacity of water.


Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.1.1.1. Inspection

- Visually inspect the pump on any form of dirt on the outside.
- Check the pump for leaks.
- Make sure the motor cover is always in place during operation.

- Listen if the pump doesn't make a weird sound (like a scratching sound for example).

- Measure the loaded amps on the pump motor. Any deviation from the tag on the pump motor indicates a problem.

5.1.1.2. Maintenance

- If there is any form of dirt on the pump, remove the dirt or clean the pump.
- Avoid spraying water directly into the motor cooling fan during cleaning.
- If there are any leaks, replace the seal in the pump.
- If there is a scratching sound, replace the bearing in the pump.

5.1.1.3. Faults

Pump is overheating

Possible cause	Solution	Other effects of the fault
Pump is dirty on the outside	Clean the pump.	Burnt bearing.
		Burnt seal.
Suction filter is clogged	See 5.11.3	

Pump is leaking

Possible cause	Solution	Other effects of the fault
Seal is worn out	Replace the seal.	Damage to electric components of the motor.

Pump is making weird noises

Possible cause	Solution	Other effects of the fault
Bearing is worn out	Replace the bearing.	Pump will pull too much current.
Nozzle is missing/clogged	See 5.5	
Suction filter is clogged	See 5.11.3	

Pump is pulling too much/not enough current

Possible cause	Solution	Other effects of the fault
Pump has dirt inside	Remove the dirt inside.	Increased wear on the seal.
		Increased wear on the bearing.
Nozzle is missing/clogged	See 5.5	
Suction filter is clogged	See 5.11.3	

5.1.1.4. Replacement

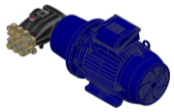
Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the pump:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove water from the reservoir.
4. Remove the electric cables
5. Remove the pump.
6. Install the new pump.
7. Connect the electric cables.

5.1.2. Piston

Piston pumps are used for high pressure since centrifugal pumps can't reach this kind of pressure. Piston pumps easily reach pressures of 100+ bar.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.1.2.1. Inspection

- Visually inspect the pump on any form of dirt on the outside.
- Check the pump for leaks.
- Check if every fitted part and all hoses are connected properly.

- Listen if the pump doesn't make a weird sound (like a scratching sound for example).

- Measure the loaded amps on the pump motor. Any deviation from the tag on the pump motor indicates a problem.

5.1.2.2. Maintenance

- If there is any form of dirt on the pump, remove the dirt or clean the pump.
- Avoid spraying water directly into the motor cooling fan during cleaning.
- If there are any leaks, replace the seal in the pump.
- If there is a scratching sound, replace the bearing in the pump.

5.1.2.3. Faults

Pump is overheating

Possible cause	Solution	Other effects of the fault
Pump is dirty on the outside	Clean the pump.	Burnt bearing.
		Burnt seal.

Pump is leaking

Possible cause	Solution	Other effects of the fault
Seal is worn out	Replace the seal.	Damage to electric components of the motor.

Pump is making weird noises

Possible cause	Solution	Other effects of the fault
Bearing is worn out	Replace the bearing.	Pump will pull too much current.
Nozzle is missing/clogged	See 5.5	

Pump is pulling too much/not enough current

Possible cause	Solution	Other effects of the fault
Pump has dirt inside	Remove the dirt inside.	Increased wear on the seal.
		Increased wear on the bearing.
Nozzle is missing/clogged	See 5.5	

5.1.2.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the pump:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove the electric cables
4. Remove the pump.
5. Install the new pump.
6. Connect the electric cables.

5.1.3. Chemical dosing pump

There's no lubrication required on the pump. It is an electric operated pump used for chemical addition to the rinse.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.1.3.1. Inspection

- Visually inspect the pump on any form of dirt on the outside.
- Check the pump for leaks.
- Check if the parameters on the pump are on the right settings.

5.1.3.2. Maintenance

- Keep the pump protected from sun and water. Avoid water splashes.
- Check the pump and piping on leakages.
- Check for unusual noise and vibrations.
- Check the electrical wiring.

5.1.3.3. Faults

Pump is not dosing

Possible cause	Solution	Other effects of the fault
Pump is not powered	Connect it to main supply.	
Pump's protection fuse is defect.	Replace the fuse.	
The filter is obstructed.	Clean the filter.	
Air bubbles inside hydraulic circuit	Check valves, hoses and fittings.	
Suction hose is empty.	Pump must be primed.	

5.1.3.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the chemical dosing pump:

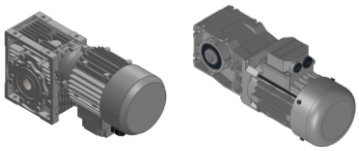
1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Disconnect the main power of the pump.
4. Remove the electric cables.
5. Remove the chemical dosing pump.
6. Place the new chemical dosing pump.
7. Connect the electric cables.
8. Connect the main power of the pump.

5.2. Motors

Motors are used in Unifortes installations are used to power the transport system, centrifugal fans and vapour extractions. The motor used for the transport system is attached to a gearbox and is therefore referred to 'geared motor' in this chapter. The motors for the centrifugal fans and vapour extractions are electric motors which are attached to a fan and are therefore referred to 'electric motor' in this chapter.

5.2.1. Geared motor

There's no lubrication required on the motors (the oil in the gearboxes is synthetic and for long life performance suited), but several factors affect motor performance. Geared motors are used for the transport system and the drum in a drum filter.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.2.1.1. Inspection

- Visually inspect the motor on any form of dirt on the outside.
- Check the motor for oil leaks.
- Check the motor monthly for wear of the gearbox in the motor

- Listen if the motor doesn't make a weird sound (like a scratching sound for example).

- Measure the loaded amps on the motor. Any deviation from the tag on the motor indicates a problem.

5.2.1.2. Maintenance

- If there is any form of dirt on the motor, remove the dirt or clean the motor.
- Avoid spraying water directly into the motor cooling fan during cleaning.
- If there are any leaks, replace the oil seal between the motor and gearbox.
- If there is a scratching sound, replace the bearing in the motor.

5.2.1.3. Faults

Motor is overheating

Possible cause	Solution	Other effects of the fault
Motor is dirty	Clean the motor.	Burnt seal.
		Burnt bearing.
Motor is overloaded	Check for load on the chain.	Burnt seal.
		Burnt bearing.
		Increased wear on gears.
		Damage to the sprockets.
		Damage to the chain.

Motor is leaking oil

Possible cause	Solution	Other effects of the fault
Oil seal is worn out	Replace the motor.	Increased wear on bearing.
		Increased wear on gears.

Motor is making weird noises

Possible cause	Solution	Other effects of the fault
Bearing is worn out	Replace/revise the motor.	Overloading the motor.
Gears are worn out	Replace/revise the motor.	Damage to the bearing.
Dirt/damage on the cooling fan	Remove dirt from the cooling fan.	Burnt seal.
		Burnt bearing.
	Replace the cooling fan.	Burnt seal.
		Burnt bearing.

Motor is pulling too much current

Possible cause	Solution	Other effects of the fault
Motor is overloaded	Check for load on the chain.	Burnt seal.
		Burnt bearing.
		Increased wear on gears.
		Damage on sprockets.
		Damage on the chain.

5.2.1.4. Replacement

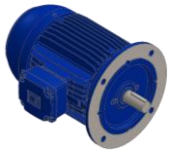
Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the motor:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove the electric cables
4. Remove the motor.
5. Install the new motor.
6. Connect the electric cables.

5.2.2. Electric motor

There's no lubrication required on the motors, but several factors affect motor performance. Electric motors are used on fans in the blow-off and on the vapour extraction system.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.2.2.1. Inspection

- Visually inspect the motor on any form of dirt on the outside.
- Check the motor monthly for wear of the gearbox in the motor

- Listen if the motor doesn't make a weird sound (like a scratching sound for example).

- Measure the loaded amps on the motor. Any deviation from the tag on the motor indicates a problem.

5.2.2.2. Maintenance

- If there is any form of dirt on the motor, remove the dirt or clean the motor.
- Avoid spraying water directly into the motor cooling fan during cleaning.
- If there is a scratching sound, replace the bearing in the motor.

5.2.2.3. Faults

Motor is overheating

Possible cause	Solution	Other effects of the fault
Motor is dirty	Clean the motor.	Burnt bearing.
Motor is overloaded	Check for load on the chain.	Burnt bearing.
		Increased wear on gears.
		Damage to the sprockets.
		Damage to the chain.

Motor is making weird noises

Possible cause	Solution	Other effects of the fault
Bearing is worn out	Replace/revise the motor.	Overloading the motor.
Gears are worn out	Replace/revise the motor.	Damage to the bearing.
Dirt/damage on the cooling fan	Remove dirt from the cooling fan.	Burnt bearing.
	Replace the cooling fan.	Burnt bearing.

Motor is pulling too much current

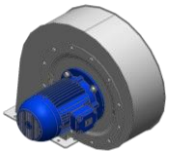
Possible cause	Solution	Other effects of the fault
Motor is overloaded	Check for load on the chain.	Burnt seal.
		Burnt bearing.
		Increased wear on gears.
		Damage on sprockets.
		Damage on the chain.

5.2.2.4. Replacement

Electric motors are mounted to other components. These components should be replaced as a whole. Contact Unifortes for replacements and look at the paragraph 5.3 for centrifugal fans in the blow-off or paragraph 5.10 for the vapour extraction.

5.3. Centrifugal fans

There's no lubrication required on the centrifugal fans, but several factors affect performance.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.3.1. Inspection

- Visually inspect the centrifugal fan motor on any form of dirt on the outside.
- Visually inspect the grid suction side on any form of dirt stuck on the outside.

- Listen if the centrifugal fan motor doesn't make a weird sound (like a scratching sound for example).

- Measure the loaded amps on the centrifugal fan motor. Any deviation from the tag on the fan motor indicates a problem.

5.3.2. Maintenance

- If there is any form of dirt on the centrifugal fan motor, remove the dirt or clean the centrifugal fan motor.
- If there is any form of dirt on the grid suction side, remove the dirt or clean the grid suction side.
- Avoid spraying water directly into the fan motor cooling fan during cleaning.
- If there is a scratching sound, replace the bearing in the motor.

5.3.3. Faults

Centrifugal fan is not blowing as supposed to

Possible cause	Solution	Other effects of the fault
Bearing is worn out	Replace the bearing.	Damage to the fan
		Damage to the blower house.
		Damage to the motor. (See 5.2.2)
Fan is damaged.	Replace the fan.	Damage to the blower house.
		Damage to the motor. (See 5.2.2)
Dirt in the blower house	Clean the blower house	Damage to the fan
		Damage to the blower house.
		Damage to the motor. (See 5.2.2)
Air supply of the centrifugal fan is obstructed.	Clean the hole of the air supply.	Damage to the fan
		Damage to the blower house.
		Damage to the motor. (See 5.2.2)

Centrifugal fan is making weird noises

Possible cause	Solution	Other effects of the fault
Bearing is worn out	Replace the bearing.	Damage to the fan
		Damage to the blower house.
		Damage to the motor. (See 5.2.2)
Fan is damaged	Replace the centrifugal fan.	Damage to the blower house.
		Damage to the motor. (See 5.2.2)
Dirt in the blower house	Clean the blower house	Damage to the fan
		Damage to the blower house.
		Damage to the motor. (See 5.2.2)
Air supply of the centrifugal fan is obstructed.	Clean the hole of the air supply.	Damage to the fan
		Damage to the blower house.
		Damage to the motor. (See 5.2.2)
Air outlet of the centrifugal fan is obstructed	Clean the hole of the air outlet.	Damage to the fan
		Damage to the blower house.
		Damage to the motor. (See 5.2.2)

5.3.4. Replacement

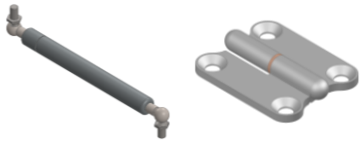
Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the centrifugal fan:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove the electric cables.
4. Remove the air knife.
5. Remove the centrifugal fan.
6. Place the new centrifugal fan.
7. Place back the air knife.
8. Connect the electric cables.

5.4. Gas struts and hinges

It is very important that all doors and hatches are closed before operation can be started to prevent any unnecessary leakages.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.4.1. Inspection

- Check if the doors and/or hoods operating with gas struts open easily and hold up solidly in the upper position.
- Check daily if all doors are closed and all lids, caps and covers are in place.
- Don't open or remove any of the doors, lids, caps and covers while the machine is in operation.

5.4.2. Maintenance

Gas struts and hinges don't require any maintenance. However they should be replaced in case they break down.

5.4.3. Faults

Door/hatch won't stay open

Possible cause	Solution	Other effects of the fault
Gas strut is defect.	Replace gas strut.	

Door/hatch won't close

Possible cause	Solution	Other effects of the fault
Gas strut is defect.	Replace gas strut.	
Hinge turns stiff	Replace hinge	

Door/hatch won't open

Possible cause	Solution	Other effects of the fault
Hinge turns stiff	Replace hinge	

5.4.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

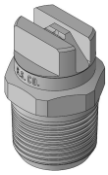
To replace a gas strut or hinge:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove the gas struts and/or hinges.
4. Place the new gas struts and/or hinges.

5.5. Spray nozzles + Clamps

The machine should never be run without any of the nozzles since this could severely damage the pump.





Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.5.1. Inspection

- Inspect daily for clogged nozzles.
- Check daily on missing nozzles.
- Check if any of the brackets for the nozzles are damaged or missing. If a bracket is mounted under a different angle as the other brackets on the same tube it is damaged.

5.5.2. Maintenance

- If any nozzles are clogged, remove all dirty material.
- If any nozzle is missing, put in a new nozzle of the same type.
- Once a month, remove the hexagonal end-caps on the spraying tubes and run the machine for several minutes in order to rinse all collectors from clogged residue. After cleaning, the hexagonal end caps should be placed back and tightened.
- If any bracket is damaged or missing, this bracket should be replaced with a new one.

5.5.3. Faults

Too much water is coming out

Possible cause	Solution	Other effects of the fault
Nozzle is missing	Replace the nozzle.	Damage to the pump. (See 5.1)
Bracket is damaged/missing	Replace the bracket.	Damage to the pump. (See 5.1)

Not enough water is coming out

Possible cause	Solution	Other effects of the fault
Nozzle is clogged	Remove the clog.	Damage to the pump. (See 5.1)
Spraying tubes are clogged.	Rinse spraying tubes to remove clog.	Damage to the pump. (See 5.1)
Suction filter is clogged	Clean the suction filter	Damage to the pump. (See 5.1)
Pump is damaged	See 5.1.1	

5.5.4. Replacement

Spare nozzles and clamps were delivered along with the installation. If these nozzles and clamps are not enough then look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

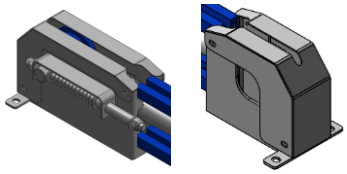
To replace nozzles and clamps:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove the nozzle and clamp.
4. Place the new nozzle and clamp.

5.6. Transport system

5.6.1. Chain transport system

The chain should always be tensioned properly and this should be checked regularly.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.6.1.1. Inspection

- Daily check the tension on conveyors.
- Check the teeth on the drive wheels every 6 months.

5.6.1.2. Maintenance

- **Some weeks** after installation or by intensive usage the chain might need to be shortened. Technical people should be called in order to take away the excessive chain.
- Make sure the chain is always tensioned properly. The spring on the reverse wheel should be compressed for a length of max 10mm when the machine is in “cold condition”.

5.6.1.3. Faults

Chain is not tensioned properly

Possible cause	Solution	Other effects of the fault
Chain is tensioned too loose.	Tighten the chain tensioner at the infeed.	Damage to washer due to loose chain collisions.
Chain is tensioned too tight.	Loosen the chain tensioner at the infeed.	Damage to the chain and/or sprockets.
Chain needs to be shortened.	(Call technical people to) Take away excessive chain.	Damage to washer due to loose chain collisions.
Spring is worn out.	Replace the spring.	Damage to washer due to loose chain collisions.

Chain is slipping

Possible cause	Solution	Other effects of the fault
Sprocket is worn out.	Replace the sprocket.	
Chain is tensioned too loose.	Tighten the chain tensioner at the infeed.	Damage to washer due to loose chain collisions.

Chain is broken

Possible cause	Solution	Other effects of the fault
Chain link is broken.	Replace the chain (link)	Damage to washer due to loose chain collisions.

Chain is scraping over the chain guide

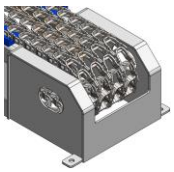
Possible cause	Solution	Other effects of the fault
Plastic chain guide profile is worn out.	Replace the plastic chain guide profile.	Damage to the chain guide.
		Increased wear to the sprockets.

5.6.1.4. Replacement

Contact Unifortes for spare parts and advise about replacement.

5.6.2. Belt transport system

The belt should always be tensioned properly and this should be checked regularly to make sure the machine will keep functioning properly.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.6.2.1. Inspection

- Daily check the tension on conveyors.
- Check the teeth on the drive wheels every 6 months.

5.6.2.2. Maintenance

- **Some weeks** after installation or by intensive usage the belt might need to be shortened. Technical people should be called in order to take away the excessive belt links.
- Make sure the belt is always tensioned properly. The spring on the reverse wheel should be compressed for a length of max 10mm when the machine is in “cold condition”.

5.6.2.3. Faults

Belt is not tensioned properly

Possible cause	Solution	Other effects of the fault
Belt is tensioned too loose.	Tighten the belt tensioner at the infeed.	Damage to washer due to loose belt collisions.
Belt is tensioned too tight.	Loosen the belt tensioner at the infeed.	Damage to the belt and/or sprockets.
Belt needs to be shortened.	(Call technical people to) Take away excessive belt.	Damage to washer due to loose belt collisions.
Spring is worn out.	Replace the spring.	Damage to washer due to loose belt collisions.

Belt is slipping

Possible cause	Solution	Other effects of the fault
Sprocket is worn out.	Replace the sprocket.	

Belt is broken

Possible cause	Solution	Other effects of the fault
Belt link is broken.	Replace the belt (link)	Damage to washer due to loose belt collisions.

Belt is scraping over the belt guide

Possible cause	Solution	Other effects of the fault
Plastic belt guide profile is worn out.	Replace the plastic belt guide profile.	Damage to the belt guide.
		Increased wear to the sprockets.

5.6.2.4. Replacement

Contact Unifortes for spare parts and advise about replacement.

5.6.3. Chain/Belt tensioner

The belt tensioner ensures that the transport chain/belt is on the right tension for optimal use.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.6.3.1. Inspection

- Daily check if the spring is still under tension.
- Daily check if the transport chain/belt is still under tension.

5.6.3.2. Maintenance

- Keep the chain/belt tensioner clean.
- Check the chain/belt tension every day.

5.6.3.3. Faults

Chain/Belt tensioner is set too loose

Possible cause	Solution	Other effects of the fault
The adjusting nut has come loose	Tighten the adjusting nut	
The spring has lost its strength	Replace the spring	

Chain/Belt tensioner is set too tight

Possible cause	Solution	Other effects of the fault
The adjustable nut is overtightened	Loosen the adjustable nut	

5.6.3.4. Replacement

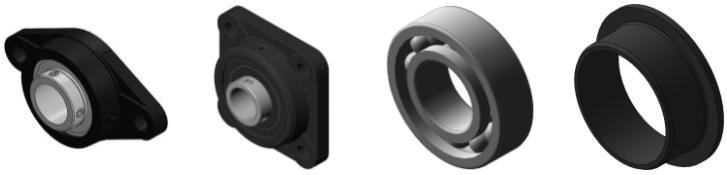
Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the belt tensioner:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove the central nut.
4. Remove the nut at the end of the chain/belt tensioner.
5. Remove the chain/belt tensioner.
6. Place the new chain/belt tensioner
7. Tighten the nut at the end of the chain/belt tensioner.
8. Tighten the central nut.

5.7. Bearings + bushings

Bearings and bushings are used on axes and other turning parts within the installation.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.7.1. Inspection

- Increased bearing temperature, friction due to contamination/dust.
- Lubricant leakage (in a bearing sealed both sides).

- Ticking, a sharp-sounding bearing noise.
- Irregular squeaking or grinding bearing noise.
- Rubbing sound.
- A whistling or squeaking sound points to inadequate lubrication.

5.7.2. Maintenance

- If symptoms point to insufficient lubrication of the bearing, it needs to be lubricated at the lubricating
- nipple provided on the bearing block.
- A bearing block must be lubricated with the lubricants appropriate to your industry.
- Clean the lubricating nipple using a dry cloth to prevent dirt from penetrating into the bearing.
- Pay attention for the counter pressure of the grease gun while adding lubrication.
- Never give more than 2 shots of grease per bearing.
- If grease pops out of the bearing, replace the bearing.
- Apply grease to optimum quantity. Exceeding or failing may cause a high friction coefficient, which shortens the bearing's life considerably.

5.7.3. Faults

Bearing is making a weird noise

Possible cause	Solution	Other effects of the fault
Not enough lubrication.	Lubricate the bearing.	Damage to the motor. (See 5.2.1)
Bearing is defect.	Replace the bearing.	Damage to the motor. (See 5.2.1)
Too much force on the bearing.	Take away the force.	

Bearing is blocking

Possible cause	Solution	Other effects of the fault
Bearing is defect.	Replace the bearing.	Damage to the motor. (See 5.2.1)

Bearing has too much tolerance

Possible cause	Solution	Other effects of the fault
Wear on the axis or bearing.	Replace the axis or bearing.	
Screws on bearing loosened through vibration.	Tighten the screws on the bearing.	

5.7.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement and advise about the replacement of the bearing and/or bushing.

5.8. Sensors

Sensors are a vital part of the installation to keep it working properly. There are various types of sensors which will be discussed in this chapter.

5.8.1. Level sensors

The installation will have two sensors to keep control of the water level inside the reservoir. There is a low level and a high level sensor. The high level sensor tells the machine when it is filled up. The low level sensor is a safety measure to protect the machine from operation without water.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

Caution! Don't turn on the machine without water, because the pump and heating elements will burn out!

5.8.1.1. Inspection

- Check if there is any dirt on the probes of the water level sensors.
- Check if the pumps shuts down when the level gets too low.
- Check if you are able to start the machine when the tank is empty.

5.8.1.2. Maintenance

- Daily clean the probes of the level sensors when the tank is empty.
- If the pump does not shut down, or is able to start when the tank is empty, look for the problem or contact Unifortes for assistance.

5.8.1.3. Faults

Water tank does not fill

Possible cause	Solution	Other effects of the fault
High level sensor is dirty	Clean the high level probe.	
High level sensor is defect	Replace the high level sensor.	
High level sensor cable is defect	Replace the high level sensor cable.	
Electric valve is defect	See 5.12	

Low level security gets activated

Possible cause	Solution	Other effects of the fault
Low level sensor is dirty	Clean the low level probe.	
Low level sensor is defect	Replace the low level sensor.	
Low level sensor cable is defect	Replace the low level sensor cable.	

5.8.1.4. Replacement

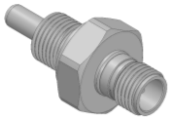
Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the level sensor:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove water from the reservoir.
4. Disconnect the cable from the level sensor.
5. Remove the level sensor from the reservoir.
6. Place the new level sensor in the reservoir.
7. Connect the cable to the new level sensor.

5.8.2. Temperature sensors

Temperature sensors measure the temperature of the water. Depending on this measurement the installation will be able to determine when the set temperature is reached.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.8.2.1. Inspection

- Check if there is any dirt on the probes of the temperature sensor.
- Check if the machine reaches the set temperature.

5.8.2.2. Maintenance

- Daily clean the probe of the temperature sensor when the tank is empty.

5.8.2.3. Faults

Water does not reach the right temperature

Possible cause	Solution	Other effects of the fault
Temperature sensor is defect	Replace the temperature sensor.	
Temperature sensor cable is defect	Replace the temperature sensor cable.	
Heating is not working properly	See 5.9	
Temperature display is not set to the right temperature	Change the temperature on the temperature display to the right temperature.	

Water does not heat up at all

Possible cause	Solution	Other effects of the fault
Temperature sensor is defect	Replace the temperature sensor.	
Temperature sensor cable is defect	Replace the temperature sensor cable.	
Heating is defect	See 5.9	
Temperature display is defect	Replace the temperature display.	

5.8.2.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace temperature sensor:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove water from the reservoir.
4. Disconnect the cable from the temperature sensor.
5. Remove the temperature sensor from the reservoir.
6. Place the new temperature sensor in the reservoir.
7. Connect the cable to the new temperature sensor.

5.8.3. Photo-electric sensors

Photo-electric sensors are used to inform the machine of when there are products going in or out of the machine.


Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.8.3.1. Inspection

- Check if the photo-electric sensors are in correct position.
- Check if the photo-electric sensors are working properly.
- Check if there is any dirt on the photo-electric sensors.
- Check if there are any damaged and/or loose cables.

5.8.3.2. Maintenance

- Put the photo-electric sensors into the correct position so that the emitter and receiver align.
- If there are any damaged and/or loose cables these should be changed or removed.
- Clean photo-electric sensor using a soft, microfiber cloth.

5.8.3.3. Faults

Photo-electric sensors are not registering any products

Possible cause	Solution	Other effects of the fault
Photo-electric sensor is defect	Replace the photo-electric sensor.	
Emitter and receiver are not aligned	Align the emitter and receiver.	
Photo-electric sensor is dirty	Clean the photo-electric sensor.	
Cable is loose/damaged	Tighten/replace the cable.	

5.8.3.4. Replacement

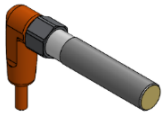
Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace photo-electric sensors:

1. Shut down the machine.
2. Lock the main switch in the ‘OFF’ position.
3. Disconnect the cable from the photo-electric sensor.
4. Remove the photo-electric sensor.
5. Place the new photo-electric sensor.
6. Connect the cable to the new photo-electric sensor.

5.8.4. Inductive sensors

The inductive sensor is a proximity sensor that detects metal objects within the range the sensor has been set.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.8.4.1. Inspection

- Check if the inductive sensors are in correct position.
- Check if the inductive sensors are working properly.
- Check if there is any dirt on the inductive sensors.
- Check if there are any damaged and/or loose cables.

5.8.4.2. Maintenance

- If there are any damaged and/or loose cables these should be changed or removed.
- Clean the inductive sensor using a soft, microfiber cloth.

5.8.4.3. Faults

Inductive sensors are not registering any products

Possible cause	Solution	Other effects of the fault
Inductive sensor is defect	Replace the inductive sensor	
Inductive sensor is dirty	Clean the inductive sensor	
Cable is loose/damaged	Tighten/replace the cable	
Metal object is not adjusted in reach of the inductive sensor	Move the sensor closer to the metal object	

5.8.4.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace inductive sensors:

1. Shut down the machine.
2. Lock the main switch in the ‘OFF’ position.
3. Disconnect the cable from the inductive sensor.
4. Remove the inductive sensor.
5. Place the new inductive sensor.
6. Connect the cable to the new inductive sensor.

5.9. Heating

Any method used to heat water requires the expenditure of energy. The method that a machine uses is often determined by the available heating source.

5.9.1. Electrical heating

Electrical heating elements should be kept clean to ensure a long lifespan and for them to work efficiently.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

Caution! Never turn on the electrical heating elements while the tank is empty! Dry-working electrical heating elements will burn in a short period of time.

Caution! Limestone covered electrical heating elements will transfer heat less efficiently and overtime will be damaged due to overheating. Clean the electrical heating elements daily to prevent the forming of limestone.

5.9.1.1. Inspection

- Check the electrical heating elements for the forming of limestone.
- Check if there is no leakage where the electrical heating elements enter the tank.

- Measure the amps on each leg of the electrical heating element. If only two legs are reading, you are losing heating capacity.

5.9.1.2. Maintenance

- Daily clean the electrical heating elements when the tank is empty.
- Remove any limestone on the electrical heating elements.
- Decalcify the machine.

5.9.1.3. Faults

Electrical heating elements do not activate

Possible cause	Solution	Other effects of the fault
Relay is open/defect	Close/repair/replace the relay.	
Low level sensor is defect	See 5.8.1	
Cable to electrical heating element is defect	Replace the cable.	
Electrical heating element is defect	Replace the electrical heating element.	
Fuse of water bath heating has blown	Verify fuses.	

Electrical heating elements do not heat up properly

Possible cause	Solution	Other effects of the fault
Limestone on electrical heating element	Clean electrical heating element.	Electrical heating element will burn eventually.
1 or more legs of the electrical heating element is defect	Replace the electrical heating element	

5.9.1.4. Replacement

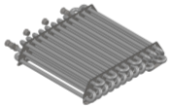
Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the electrical heating element:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove water from the reservoir.
4. Disconnect the cable from the electrical heating element.
5. Remove the electrical heating element.
6. Install the new electrical heating element.
7. Connect the cable to the new electrical heating element.

5.9.2. Heat exchanger

The effectivity of a heat exchanger is dependable on the matter that goes through it. Depending on the temperature of the matter the water in the reservoir will reach a certain temperature.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.9.2.1. Inspection

- Check if the water has a minimum temperature of 82°C - 88°C when circulating through the loop.

5.9.2.2. Maintenance

- Clean the heat exchanger when the tank is empty.

5.9.2.3. Faults

Water does not reach the needed temperature

Possible cause	Solution	Other effects of the fault
Electric valve is not opening	See 5.12	
Fuse of water bath heating has blown	Verify fuses.	
Heat exchanger is leaking	Replace the heat exchanger.	
Temperature sensor is not working properly	See 5.8.2	
Heat exchanger pipes are dirty	Clean the heat exchanger pipes	

5.9.2.4. Replacement

Contact Unifortes for service and replacement of the heat exchanger.

5.9.3. Steam injection spurge pipes

To be able to use steam injection the customer should have a supply of steam to his disposal to blow into the steam injection system.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.9.3.1. Inspection

- Check for any leaks on the steam injection spurge pipes in the washer and the main piping to the washer.
- Double-check that all steam lines are insulated or protected to prevent burns and heat loss.
- Check the steam valves to ensure they operate properly.

5.9.3.2. Maintenance

- Clean the steam injection spurge pipes when the tank is empty.

5.9.3.3. Faults

Water does not reach the needed temperature

Possible cause	Solution	Other effects of the fault
Pneumatic valve is not opening	See 5.12.2	
Spurge pipe is broken	Replace the pipe.	

5.9.3.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the steam injection spurge pipe:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove water from the reservoir.
4. Remove the steam injection.
5. Install the new steam injection.

5.10. Vapour extraction

The vapour extraction is placed on top of the washer to extract the vapour on the inside and prevent the forming of vapour clouds.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.10.1. Inspection

- Visually inspect the fan motor on any form of dirt on the outside.
- Daily check if the condensate return at the bottom of the spiral is not obstructed.

- Listen if the fan motor doesn't make a weird sound (like a scratching sound for example).

- Measure the loaded amps on the fan motor. Any deviation from the tag on the fan motor indicates a problem.

5.10.2. Maintenance

- If there is any form of dirt on the fan motor, remove the dirt or clean the fan motor.
- Avoid spraying water directly into the fan motor cooling fan during cleaning.
- If there is a scratching sound, replace the bearing in the motor.

5.10.3. Faults

Vapour is not extracted properly

Possible cause	Solution	Other effects of the fault
Bearing is worn out	Replace the bearing.	Damage to the fan
		Damage to the blower house.
		Damage to the motor. (See 5.2.2)
Fan is damaged.	Replace the fan.	Damage to the blower house.
		Damage to the motor. (See 5.2.2)
Dirt in the blower house	Clean the blower house	Damage to the fan
		Damage to the blower house.
		Damage to the motor. (See 5.2.2)
Blower house is full of water	Remove obstruction to the condensate return.	Damage to the fan
		Damage to the blower house.
		Damage to the motor. (See 5.2.2)

Fan is making weird noises

Possible cause	Solution	Other effects of the fault
Bearing is worn out	Replace the bearing.	Damage to the fan
		Damage to the blower house.
		Damage to the motor. (See 5.2.2)
Fan is damaged.	Replace the fan.	Damage to the blower house.
		Damage to the motor. (See 5.2.2)
Dirt in the blower house	Clean the blower house	Damage to the fan
		Damage to the blower house.
		Damage to the motor. (See 5.2.2)
Blower house is full of water	Remove obstruction to the condensate return.	Damage to the fan
		Damage to the blower house.
		Damage to the motor. (See 5.2.2)

5.10.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the vapour extraction:

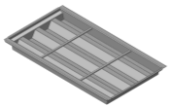
1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove the electric cables.
4. Remove the vapour extraction.
5. Place the new vapour extraction.
6. Connect the electric cables.

5.11. Filters

The industrial washing line is usually fitted with filter trays inside the reservoir or optionally with an external drum filter. The filter trays/baskets can be taken out of the machine completely to clean and the drum/cloth filter has hatch plates which can be taken out to clean.

5.11.1. Filter trays

Filter trays are placed directly into the top of the reservoir to prevent any dirt from clogging up the nozzles or damaging the pump.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

Caution! Never remove the filters during operation. This will cause obstruction of the nozzles and/or even damage to the pumps.

5.11.1.1. Inspection

- Daily check the filter trays for dirt and damage.

5.11.1.2. Maintenance

- Daily remove and clean the filter trays outside the machine.

5.11.1.3. Faults

Reservoir is overflowing

Possible cause	Solution	Other effects of the fault
Filter tray is clogged.	Remove all the material from the filter tray.	Pump will be damaged due to water not being filtered.

5.11.1.4. Replacement

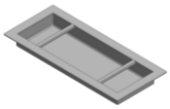
Contact Unifortes for a replacement filter tray.

To replace the filter tray:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove filter tray from the machine.
4. Place new filter tray in the machine.

5.11.2. Filter baskets

Filter baskets are placed into the drain pans of the rinse, infeed table, transition table and in- and outfeed of the blow-off to prevent any dirt from clogging up the nozzles or damaging the pump.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

Caution! Never remove the filters during operation. This will cause obstruction of the nozzles and/or even damage to the pumps.

5.11.2.1. Inspection

- Daily check the filter baskets for dirt and damage.

5.11.2.2. Maintenance

- Daily remove and clean the filter baskets outside the machine.

5.11.2.3. Faults

Water does not drain from the drain pan

Possible cause	Solution	Other effects of the fault
Filter basket is clogged.	Remove all the material from the filter basket.	Pump will be damaged due to water not being filtered.

5.11.2.4. Replacement

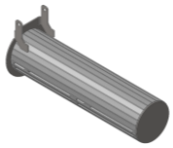
Contact Unifortes for a replacement filter basket.

To replace the filter basket:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove filter basket from the machine.
4. Place new filter basket in the machine.

5.11.3. Suction filter

The suction filter is placed inside the reservoir at the suction pipe of the pump. This filter prevents dirt from being sucked into the pump.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

Caution! Never remove the filters during operation. This will cause obstruction of the nozzles and/or even damage to the pumps.

Caution! Never remove the suction filter on the pump suction tube when there is still water in the reservoir. This is a major security part for the pump.

5.11.3.1. Inspection

- Daily check the suction filter for clogging.

5.11.3.2. Maintenance

- Daily remove and clean the suction filter outside of the machine. Drain the water from the reservoir before removing the suction filter!

5.11.3.3. Faults

Pump is not sucking in enough water

Possible cause	Solution	Other effects of the fault
Suction filter is clogged.	Remove all the material from the suction filter.	Pump will be damaged due to water not being filtered.

5.11.3.4. Replacement

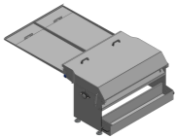
Contact Unifortes for a replacement suction filter.

To replace the suction filter:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove water from the reservoir.
4. Remove sucton filter from the reservoir.
5. Place new suction filter in the reservoir.

5.11.4. Drum filter

The drum filter is placed directly next to the reservoir to catch all the dirty water. This water will then go through the drum to filter it.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

Caution! Never remove the filter hatch plates during operation. This will cause obstruction of the nozzles and/or even damage to the pumps.

5.11.4.1. Inspection

- Daily check the filter hatch plates for dirt and damage.
- Daily check the drum for dirt and damage
- Visually inspect the motor on the drum filter on any form of dirt on the outside.
- Check if the scraper has the right tension regarding the drum.
- Check if the cover with gas cylinders does open easily and holds up solidly in the upper position.

5.11.4.2. Maintenance

- Daily remove and clean the filter hatch plates outside the machine.
- Clean the drum with fresh water. (As an exception, this maintenance can be done during operation)
- Clean the motor on the drum filter.
- Avoid spraying water into the fan of the motor during cleaning.
- Clean the scraper.
- Empty the container.

5.11.4.3. Faults

Drum does not rotate

Possible cause	Solution	Other effects of the fault
Problem with the motor.	See 5.2	Pump will be damaged due to water not being filtered. (if ignored for too long)

Drum filter does not filter properly

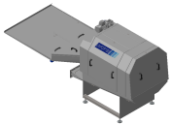
Possible cause	Solution	Other effects of the fault
Scraper is not tensioned correctly.	Tension scraper to hand tight position.	Pump will be damaged due to water not being filtered. (if ignored for too long)

5.11.4.4. Replacement

Contact Unifortes for spare parts and advice about the replacements.

5.11.5. Cloth filter

The cloth filter is placed directly next to the reservoir to catch all the dirty water. This water will then go through the cloth which is mounted inside the drum to filter it.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

Caution! Never remove the filter hatch plates during operation. This will cause obstruction of the nozzles and/or even damage to the pumps.

5.11.5.1. Inspection

- Daily check the filter hatch plates for dirt and damage.
- Daily check the cloth in the drum for dirt and damage
- Visually inspect the motor on the drum filter on any form of dirt on the outside.

5.11.5.2. Maintenance

- Daily remove and clean the filter hatch plates outside the machine.
- Clean the motor on the drum filter.
- Replace the cloth in the drum.
- Avoid spraying water into the fan of the motor during cleaning.
- Empty the container.

5.11.5.3. Faults

Drum does not rotate

Possible cause	Solution	Other effects of the fault
Problem with the motor	See 5.2	Pump will be damaged due to water not being filtered. (if ignored for too long)

Drum filter does not filter properly

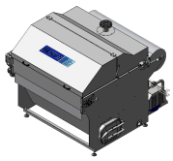
Possible cause	Solution	Other effects of the fault
Cloth in the drum is dirty and worn out	Replace the cloth in the drum filter.	Pump will be damaged due to water not being filtered. (if ignored for too long)

5.11.5.4. Replacement

Contact Unifortes for spare parts and advice about the replacements.

5.11.6. Compact belt filter

The cloth filter is placed next to the machine and connected through a series of pipes. The water transported to the filter will fall through the paper in the filter which takes out the sand and dirt. The clean water will be pumped back to the machine



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

Caution! Never remove the filter hatch plates during operation. This will cause obstruction of the nozzles and/or even damage to the pumps.

5.11.6.1. Inspection

- Daily check the inside of the compact belt filter for dirt and damage.
- Daily check the paper for dirt and damage
- Visually inspect the motor on the filter on any form of dirt on the outside.

5.11.6.2. Maintenance

- Daily clean the inside of the filter to prevent dirt build up overtime.
- Clean the motor on the filter.
- Replace the paper roll when all the paper has been used.
- Avoid spraying water into the fan of the motor during cleaning.

5.11.6.3. Faults

Drum does not rotate

Possible cause	Solution	Other effects of the fault
Problem with the motor	See 5.2	Pump will be damaged due to water not being filtered. (if ignored for too long)

Compact belt filter does not filter properly

Possible cause	Solution	Other effects of the fault
Paper in the compact belt filter is dirty.	Replace the paper in the compact belt filter.	Pump will be damaged due to water not being filtered. (if ignored for too long)

5.11.6.4. Replacement

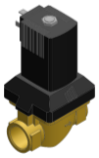
Contact Unifortes for spare parts and advice about the replacements.

5.12. Water/steam valves

There are several electric and/or pneumatic valves mounted on the machine. These valves are controlled through the control cabinet.

5.12.1. Electric

Electric valves are used on the Unifortes installations to fill up the reservoir with water and are connected to the rinse spray line.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.12.1.1. Inspection

- Daily check if the valves are still working properly.
- Check if the cables are connected.

5.12.1.2. Maintenance

- Keep the valves clean.
- Test if the valves are working properly.

5.12.1.3. Faults

Water tank does not fill

Possible cause	Solution	Other effects of the fault
Electric valve is defect	Replace the electric valve.	
Cable to electric valve is defect	Replace the cable.	
Relay is defect	Replace the relay.	
High level sensor is defect	See 5.8.1	

Water tank does not stop filling

Possible cause	Solution	Other effects of the fault
Electric valve is defect	Replace the electric valve.	

Rinse does not turn on

Possible cause	Solution	Other effects of the fault
Electric valve is defect.	Replace the electric valve.	
Cable to electric valve is defect.	Replace the cable.	
Relay is defect.	Replace the relay.	

Rinse does not turn off

Possible cause	Solution	Other effects of the fault
Electric valve is defect.	Replace the electric valve.	

5.12.1.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the electric valve from the reservoir:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove water from the reservoir.
4. Disconnect the cable from the electric valve.
5. Remove the electric valve from the reservoir.
6. Place the new electric valve in the reservoir.
7. Connect the cable to the new electric valve.

To replace the electric valve from the rinse module:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Disconnect the cable from the electric valve.
4. Remove the electric valve from the rinse module.
5. Place the new electric valve on the rinse module.
6. Connect the cable to the new electric valve.

5.12.2. Pneumatic

Pneumatic valves are used for the steam injection heating. They prevent steam coming out of the steam injection while the machine is turned off.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.12.2.1. Inspection

- Daily check if the valves are still working properly.
- Check if the cables are connected.

5.12.2.2. Maintenance

- Keep the valves clean.
- Test if the valves are working properly.

5.12.2.3. Faults

Steam injection is not working

Possible cause	Solution	Other effects of the fault
Pneumatic valve is defect	Replace the electric valve.	
Electric cable to pneumatic valve is defect	Replace the electric cable.	
Pneumatic system is defect	Replace the pneumatic system.	
Relay is defect	Replace the relay.	

5.12.2.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the pneumatic valve on the steam injection:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove water from the reservoir.
4. Disconnect the cables from the pneumatic valve.
5. Remove the pneumatic valve from the steam injection.
6. Place the new pneumatic valve on the steam injection.
7. Connect the cables to the new pneumatic valve.

5.12.3. Overflow safety valve (adjustable)

The overflow safety valves are used on the Unifortes installations to prevent an overpressure in the system.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.12.3.1. Inspection

- Daily check if the valve is still working properly. If the required pressure in the rinse module has been reached the valve is working.

5.12.3.2. Maintenance

- Keep the valves clean.
- Test if the valves are working properly.

5.12.3.3. Faults

Low water pressure in rinse section

Possible cause	Solution	Other effects of the fault
Overflow safety valve is defect	Replace the overflow safety valve.	
Overflow safety valve is closed	Open the overflow safety valve by turning the nut counter clockwise until the pressure in the rinse raises.	Pressure in the wash section is higher.

Low water pressure in wash section

Possible cause	Solution	Other effects of the fault
Overflow safety valve is defect	Replace the overflow safety valve.	
Overflow safety valve is fully open	Close the overflow safety valve a bit more by turning the nut clockwise until the pressure in the wash section raises.	

5.12.3.4. Replacement

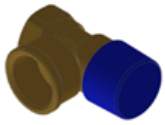
Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace overflow safety valve from the washer:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove the overflow safety valve.
4. Place the new overflow safety valve.
5. Loosen the nut on the valve by turning counter clockwise.
6. Start up the machine.
7. Fasten the nut clockwise until the required pressures have been reached.

5.12.4. Pressure relief valve (not adjustable)

The pressure relief valve on the Unifortes installations is placed to prevent an overpressure in the rinse circuit.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.12.4.1. Inspection

- Daily check if the valve is still working properly. If the required pressure in the rinse module has been reached the valve is working.

5.12.4.2. Maintenance

- Keep the valves clean.
- Test if the valves are working properly.

5.12.4.3. Faults

High water pressure in Rinse section

Possible cause	Solution	Other effects of the fault
Pressure relief valve is defect	Replace the pressure relief valve.	No water is going through this valve into the washing machine.

5.12.4.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the pressure relief valve from the washer:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove the bushing *(inside of the machine).*
4. Remove the pressure relief valve.
5. Place the new pressure relief valve.
6. Place back the bushing to fasten the valve.

5.12.5. Pressure switch

The pressure switch is used on the Unifortes installations to regulate the incoming pressure by setting a maximum pressure range.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.12.5.1. Inspection

- Daily check if the valve is still working properly.

5.12.5.2. Maintenance

- Keep the valves clean.
- Test if the valves are working properly.

5.12.5.3. Faults

Washing machine do not start.

Possible cause	Solution	Other effects of the fault
Pressure switch is defect	Replace the pressure switch.	
Cable to pressure switch is defect	Replace the cable.	
Relay is defect	Replace the relay.	

5.12.5.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the pressure switch from the washer:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Disconnect the cable from the pressure switch .
4. Remove the pressure switch.
5. Place the new pressure switch on the washer.
6. Connect the cable to the new pressure switch.

5.13. Water hoses

Water hoses are installed to transport water from the water supply to the wash and rinse sections.

5.13.1. High pressure hose

The high pressure hose is installed to transport the fresh water from the piston pump to the wash and rinse sections.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.13.1.1. Inspection

- Check if all hoses are tighten with their couplings.
- Check if there are any damages and/or leaks.

5.13.1.2. Maintenance

- Keep the hoses clean
- If there are any damages and/or leaks, stop the machine.

5.13.1.3. Faults

Water leaks from the hoses

Possible cause	Solution	Other effects of the fault
Couplings from hoses are loose	Fasten the couplings.	In case of a major leak, de water pressure will drop.
Hoses are defect	Place new hoses.	
Hoses are worn out	Place new hoses and check how the damage has occurred.	

5.13.1.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the high pressure hoses:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove the hoses by turning loose the couplings.
4. Remove the high pressure hoses.
5. Place the new high pressure hoses.
6. Connect the new hoses.

5.13.2. Suction hose

The suction hose is placed for the transport of fresh water between the water supply valve and the piston pump

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.13.2.1. Inspection

- Check if the hose ends are tight with hose clamps.
- Check if there are any damages and/or leaks.

5.13.2.2. Maintenance

- Keep the suction hose clean.
- If there are any damages and/or leaks, stop the machine.

5.13.2.3. Faults

Water leaks from the hose

Possible cause	Solution	Other effects of the fault
Hose clamps are loose.	Fasten the hose clamps.	
	Place new hose clamps.	
Hose is defect.	Place new hose.	In case of a major leak, the pump will suck in air.
Hose is worn out.	Place new hose and check how the damage has occurred.	

5.13.2.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the suction hose:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Remove the hose clamps.
4. Remove the suction hose.
5. Place back a new suction hose.
6. Place back the hose clamps.

5.14. Pneumatic equipment.

Pneumatic equipment is used through the whole installation. The pneumatic equipment is controlled through the control cabinet.

5.14.1. Pneumatic cylinders

Pneumatic cylinders are used throughout the whole installation.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.14.1.1. Inspection

- Check if there are any air hoses that are torn or loose.
- Check if the pneumatic cylinder makes a full stroke.
- Check if there is any dirt on the piston rod.

- Listen if you hear a whistling sound from the air hoses, which points to a leak air hose.

5.14.1.2. Maintenance

- Keep the cylinders clean.
- Replace air hoses in case of rupture.
- Avoid spraying water on the piston rod.
- If the cylinder does not make a full stroke, check the air hoses for any leakage of loose ends. If that is not the case, remove and replace the pneumatic cylinder.
- Check if the bolts and nuts are still fastened.

5.14.1.3. Faults

Piston rod does not move

Possible cause	Solution	Other effects of the fault
Air leakage	Check air hoses and the cylinder. If necessary, replace the cables and/or cylinder.	
Air hoses are defect	Replace the air hoses.	
Seals of the cylinder are defect	Replace the pneumatic cylinder.	
The air valves are not working	See 5.14.4	
The sensor is not working	See 5.8.3	

Air is leaking to the outside

Possible cause	Solution	Other effects of the fault
Air hoses are defect	Replace the air hoses.	
Seals of the cylinder are defect	Replace the pneumatic cylinder.	

Piston rod gets stuck

Possible cause	Solution	Other effects of the fault
Dirt on the piston rod	Remove all the dirt from the piston rod.	Damaging the seals and inside of the cylinder.

5.14.1.4. Replacement

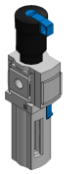
Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the pneumatic cylinder in the infeed conveyor:

1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Disconnect the air hoses.
4. Remove the pneumatic cylinder from the infeed conveyor.
5. Place new pneumatic cylinder in the infeed conveyor.
6. Connect the air hoses.

5.14.2. Pressure regulator

The pressure regulator is intended to filter moisture and tiny dirt particles from the air, to supply dry and clean air for all the pneumatic equipment. Thereby, the pressure can also be adjusted.



Caution! Always switch OFF the machine and close the air connection on the wall before checking, maintaining or replacing a component in view of hazards and possible faults!

Caution! Never remove the filter during operation. This will cause obstruction of the pneumatic equipment.

5.14.2.1. Inspection

- Check the condensate drain on the pressure regulator at a pressure increase / pressure decrease.

5.14.2.2. Maintenance

- Remove and clean the pressure regulator outside of the machine.

5.14.2.3. Faults

Pneumatic equipment does not get enough air

Possible cause	Solution	Other effects of the fault
Filter regulator is saturated	Check the condensate drain and clean the filter.	Pneumatic equipment will be damaged due to air not being filtered (if ignored for too long)
Leak air hose	Replace the leak air hose	
Infeed is clogged	Clean the infeed	
Outfeed is clogged	Clean the Outfeed	
Pressure control knob is defect	Replace the pressure control knob	
Detection clock is defect	Replace the pressure regulator	

5.14.2.4. Replacement

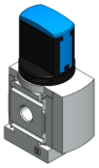
Contact Unifortes for spare parts and advice about the replacements.

To replace the filter in the pressure regulator:

1. Shut down the machine.
2. Lock the main switch in the ''OFF'' position.
3. Close the air valve on the wall.
4. Remove the air hose from the pressure regulator.
5. Remove the pressure regulator from the stand it is placed on.
6. Place the new pressure regulator on the stand.
7. Connect the air hose.

5.14.3. Shut-off valve

Shut off valves are designed to safely manage compressed air in pneumatic applications, and are used to block compressed air in an industrial automation process.



Caution! Always switch OFF the machine and close the air connection on the wall before checking, maintaining or replacing a component in view of hazards and possible faults!

5.14.3.1. Inspection

- Check the manometer for the pressure.

5.14.3.2. Maintenance

- Check the manometer for the right pressure.

5.14.3.3. Faults

Shut-off valve does not work

Possible cause	Solution	Other effects of the fault
Plugged air silencer	Clean or replace the air silencer.	
Clogged infeed	Clean the infeed.	
Clogged outfeed	Clean the outfeed.	

5.14.3.4. Replacement

Contact Unifortes for spare parts and advice about the replacements.

To replace the shut-off valve:

1. Shut down the machine.
2. Lock the main switch in the ‘’OFF’’ position.
3. Close the air valve on the wall.

5.14.4. Safety valve

If pressure exceeds the amount allowed by the safety valve, the safety valve will automatically open and release air until the pressure is reduced.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.14.4.1. Inspection

- Check if the safety valve is able to open.

5.14.4.2. Maintenance

- Keep the safety valve clean.

5.14.4.3. Faults

Safety valve does not work

Possible cause	Solution	Other effects of the fault
There is not enough air pressure	Check if the pressure regulator is working correctly.	
Safety valve is defect	Replace the safety valve.	

5.14.4.4. Replacement

Contact Unifortes for spare parts and advice about the replacements.

To replace the safety valve:

1. Shut down the machine.
2. Lock the main switch in the ''OFF'' position.
3. Close the air valve on the wall.
4. Disconnect the safety valve.
5. Replace the safety valve.
6. Connect the safety valve.
7. Open the air valve on the wall.

5.15. Roller brush

The roller brush is used to push the product from the transport chain into the stacker.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.15.1. Inspection

- Check for dirt on the roller brush.
- Check if nothing is stuck between the roller brush.

5.15.2. Maintenance

- Keep the roller brush clean.
- Replace the roller brush in case of when the bristles are worn out or when the bristles are falling out of the brush.

5.15.3. Faults

Roller brush does not move as supposed to

Possible cause	Solution	Other effects of the fault
An object that is stuck between the Roller brush and the housing	remove the object that is stuck	
Bearings are worn out	See 5.6.3	Damage to the motor (see 5.2.1)
Geared motor is defect	See 5.2.1	
Inductive sensor is defect	See **Fout! Verwijzingsbron niet gevonden.**	

5.15.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the roller brush:

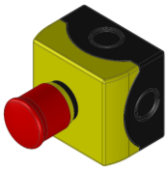
1. Shut down the machine.
2. Lock the main switch in the 'OFF' position.
3. Disconnect the cables.
4. Remove the top cover.
5. Remove the geared motor.
6. Remove the bolts of the cover plate.
7. Remove the bolts of the bearing block.
8. Remove the feather key from the shaft.
9. Remove the roller brush from the shaft.
10. Place the new roller brush on the shaft.
11. Place the key on the shaft.
12. Tighten the bolts on the bearing block.
13. Tighten the bolts on the cover plate.
14. Place the geared motor.
15. Place the top cover.
16. Connect the cables.

5.16. Safety systems

Safety systems are installed around the installation to prevent injuries and accidents regarding the installation.

5.16.1. Emergency stop button

The emergency stop buttons are placed at all the places where an operator will be stationed during operation. They should be pressed in case of an emergency to stop the installation immediately.



Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.16.1.1. Inspection

- Check if all the emergency stop buttons are working properly.
- Check if there are any damaged and/or loose cables.

5.16.1.2. Maintenance

- Keep the emergency stop buttons clean
- If there are any damaged and/or loose cables these should be changed or removed.

5.16.1.3. Faults

Machine does not activate emergency stop when the button is pressed

Possible cause	Solution	Other effects of the fault
Emergency stop button is defect	Replace the emergency stop button.	
Emergency stop button cable is defect	Replace the emergency stop button cable.	
Relay is defect	Replace the relay.	

5.16.1.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the emergency stop button:

7. Shut down the machine.
8. Lock the main switch in the 'OFF' position.
9. Remove the electric cables from the emergency stop button.
10. Remove the emergency stop button.
11. Place the new emergency stop button.
12. Connect the electric cables.

Note: It is strongly forbidden to override safety contacts because they are part of the total safety system and the CE label.

5.16.2. Safety switches

Safety switches are placed on doors and hatches as a safety measure. The installation can't be operated while the doors and hatches are open.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.16.2.1. Inspection

- Check if the machine shuts down when the doors with contact switches are opened.
- Check if there are any damaged and/or loose cables.

5.16.2.2. Maintenance

- Keep the safety switches clean.
- If there are any damaged and/or loose cables these should be changed or removed.

5.16.2.3. Faults

Machine does not activate emergency stop when door is opened

Possible cause	Solution	Other effects of the fault
Safety switch is defect	Replace the safety switch.	
Safety switch cable is defect	Replace the safety switch cable.	
Relay is defect	Replace the relay.	

5.16.2.4. Replacement

Look up the corresponding part on the by Unifortes supplied spare parts list and contact Unifortes for a replacement.

To replace the safety switch:

7. Shut down the machine.
8. Lock the main switch in the 'OFF' position.
9. Remove the electric cables from the safety switch.
10. Remove the safety switch.
11. Place the new safety switch.
12. Connect the electric cables.

Note: It is strongly forbidden to override safety contacts because they are part of the total safety system and the CE label.

5.17. Electrical components

Every machine is fitted with a control cabinet which contains the electrical components to control the machine. The control cabinet is most likely mounted on the side of the rinse section on the operating side or is mounted on a stand-alone mount at a position chosen by the customer.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

5.17.1. Inspection

- Daily check if all the buttons and lights on the control cabinet are working properly.
- Check for dirt on the inside and outside of the control cabinet.
- Check if all the cables inside the control cabinet are still connected

5.17.2. Maintenance

- Avoid water being sprayed on the electrical panel, even with the door closed.
- Clean the inside of the switch box as well, using a dry cloth.
- Test the buttons on the control cabinet if they are working properly.
- If there are any damaged and/or loose cables these should be changed or removed.

5.17.3. Faults

Button/light is not working

Possible cause	Solution	Other effects of the fault
Button/light is defect	Replace the button/light.	
Cable has been disconnected	Reconnect the cable.	
Cable is defect	Replace the cable.	
Relay is defect	Replace the relay.	
PLC is defect	Replace the PLC.	

5.17.4. Replacement

Contact Unifortes for spare parts and advice about the replacements.

Note: It is strongly forbidden to override safety contacts because they are part of the total safety system and the CE label.

6. Periodic maintenance

Maintenance should be done regularly to ensure the machine stays in good condition and keeps performing properly. This chapter explains when certain maintenance should be carried out.

6.1. Daily maintenance

Daily maintenance is done so regularly because these parts or this routine is critical to ensure the machine keeps working properly.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

After operation always make sure the following list is checked:

Component	What	How
General	Clean the machine on the in- and outside.	Preferably use a manual high pressure washer.
	Clean the environment around the machine.	Clean the floor to avoid it becoming slippery.
Filter	Clean.	See 5.11
Level sensor	Clean the probe.	See 5.8.1
Spray nozzles	Check for clogging.	See 5.5
Safety systems	Examine if they still work properly.	See 5.14
Suction filter	Check for and remove any clogging.	See 5.11.3
Electrical heating elements	Clean thoroughly	See 5.9.1
Pumps, fans and motors	Quickly visual check for leakage and listen for strange noises.	See 5.1, 5.2, 5.3 and 5.10
	Clean if there is any dirt on the outside.	See 5.1, 5.2, 5.3 and 5.10

6.2. Weekly maintenance

Weekly maintenance should be checked regularly. These parts are not critical, but may give big problems in the long run if maintenance is not done properly.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

Component	What	How
Return water pipes	Check for clogging.	Remove and flush with water to remove the clog.
Level sensor	Check, clean.	See 5.8.1
Heating elements	Check for limestone.	See 5.9.1
Photocells, proximity switches	Check position, clean	See 5.8.3
Temperature sensor	Check if still operates correctly.	See 5.8.2
Scraper (Only applies if the machine has a drum filter)	Check position.	See 5.11.4

6.3. Monthly maintenance

Monthly maintenance is important to keep the machine working properly. However it is not so critical that a day can make a big difference on the working of the machine.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

Component	What	How
Spray lines/nozzles	Check and remove clog	See 5.5
Chain/belt	Check for proper tension and length	See 5.6
Bearings	Check, clean and lubricate	See 5.6.3

6.4. Special maintenance

Special maintenance does not have to be done on a regular basis, but these have to be carried out after a certain runtime of the part.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

The following points need to be checked for special maintenance:

- After 10.000 work hours (+/- 2 years) the transmission oil in the motor has to be changed. For gears type SA after 20.000 work hours (+/- 4 years).
- Each 5 years the electrical panel has to be approved by a certification body. We advise that authorized personnel of the technical support service of Unifortes will do these operations.

7. Decommissioning, storage and reinstallation

In case of the machine being stored and possibly reinstalled in the future, we recommend you to contact Unifortes. This way we will be able to give advice about the disassembling, placement and environmental conditions of the machine. This way we can make sure the machine will be able to perform optimally after reinstallation.

In case of questions about the decommissioning, storage and reinstallation, please contact:

Unifortes B.V.
Telephone: +31 (0)78 6291262
E-mail: info@unifortes.com

8. Faults

This chapter will give an indication of possible problems that may occur regarding the machine. Whenever a problem occurs check if one of the mentioned possible causes is what is causing the problem. When the cause is found take the corresponding action. For any questions regarding problems and possible actions, contact Unifortes.

Caution! Always switch OFF the machine before checking, maintaining or replacing a component in view of hazards and possible faults!

8.1. Start-up and error lights

Faults that occur during start-up of the machine.

8.1.1. Red and yellow light are on

Problem	Possible cause	Possible solution	Chapter
Emergency stop is activated.	An emergency stop button is pushed in.	Pull every emergency stop button and reset the emergency stop.	See 5.16.1
	A safety switch on the doors is activated.	Close all doors and reset the emergency stop.	See 5.16.2
	Relay is not working properly.	Check relays and replace the relay if necessary.	See 5.17
	Problem with automation around the installation	Check the automation and photo-electric devices that effect the working of the automation.	See 5.8.3

8.1.2. Yellow light is flickering

Problem	Possible cause	Possible solution	Chapter
Low water level sensor is not giving a signal.	The probe of the sensor is dirty.	Clean the probe.	See 5.8.1
	Sensor is defect.	Replace the sensor.	See 5.8.1
	Cable or relay is defect.	Replace the cable and/or relay.	See 5.17
Reservoir does not fill with water.	Water is flowing out of the reservoir.	Drain valve is open; close the drain valve.	
		Check if all parts in the reservoir are connected properly.	
		Check for leakages in the reservoir.	
	Electric valve does not open.	Check the electric valve.	See 5.12.1
		Check the relay of the electric valve.	See 5.17

8.1.3. Yellow light is on continuously

Problem	Possible cause	Possible solution	Chapter
Electrical failure.	Fuse blown by too high ampere of a certain part.	Check fuses and check the corresponding part.	See 5.17

8.1.4. No lights are burning

Problem	Possible cause	Possible solution	Chapter
Green light is not turning on.	Light is defect.	Replace the light.	See 5.17
	No 24 Volt to the control cabinet.	Verify the fuse.	See 5.17
No electrical current on the control cabinet.	Problem with the electrical power supply.	Check the electrical power supply to the machine.	
	Main switch is turned off.	Turn on the main switch.	See 5.17

8.2. During operation

Faults that occur during and affect operation in a negative way.

8.2.1. Failing functions

Problem	Possible cause	Possible solution	Chapter
Reservoir does not fill with water.	Water is flowing out of the reservoir.	Drain valve is open; close the drain valve.	
		Check if all parts in the reservoir are connected properly.	
		Check for leakages in the reservoir.	
	Electric valve does not open.	Check the electric valve.	See 5.12.1
		Check the relay of the electric valve.	See 5.17
Conveyor does not start.	Problem with the transport motor.	Check the transport motor.	See 5.2.1
	Problem with photo-electric devices	Check the photo-electric devices.	See 5.8.3
Pump does not start.	Blown pump fuse.	Verify the pump fuse.	See 5.17
	Problem with the pump.	Repair or replace the pump.	See 5.1.1
	High water level sensor is not giving a signal.	Check the high water level sensor.	See 5.8.1
Crate is blocked into wash or dry zone.	Broken product in the installation.	Stop the installation and take out the product.	
	Top guide is not pushing the product down enough.	Make the top guide heavier.	
		Top guide is fixed too tight; loosen top guide.	

8.2.2. Washing/drying result

Problem	Possible cause	Possible solution	Chapter
Bad washing result.	Problem with the nozzles.	Make sure every nozzle is in place and no nozzles are clogged.	See 5.5
	Chemistry is not working properly.	Contact chemistry supplier for advice about the correct application of the chemistry.	
	Problem with transport.	Transport speed too high; reduce transport speed.	
		Top guide is too light; Make top guide heavier.	
Wash water does not reach the set temperature.	Electrical heating is not activated.	Check if relay is closed; if defect, replace relay.	See 5.17
	Heating device is defect.	Replace the heating device.	See 5.9
	Fuse of heating is blown.	Verify fuses.	See 5.17
	Too cold water inlet.	Increase the water inlet temperature.	
	Too much temperature lost by vapour extraction.	Reduce the opening of the vapour extraction valve.	See 5.10
	Failing temperature sensor.	Check if the temperature sensor is working properly.	See 5.8.2
	Wrong set temperature.	Set the right temperature on the control cabinet.	
Too much foaming.	Wrong water temperature.	Contact chemistry supplier and change the temperature according their advice.	
	Wrong chemistry dose.	Contact chemistry supplier.	
	Too much blood in the water.	Reduce blood quantity into products.	
Bad drying result.	Problem with centrifugal fan.	Check if the centrifugal fans are still working properly.	See 5.3
	Too much residual moisture due to rinse temperature being too low.	Increase the rinse water temperature.	
	Problem with transport.	Transport speed too high; reduce transport speed.	
		Top guide is too light; Make top guide heavier.	