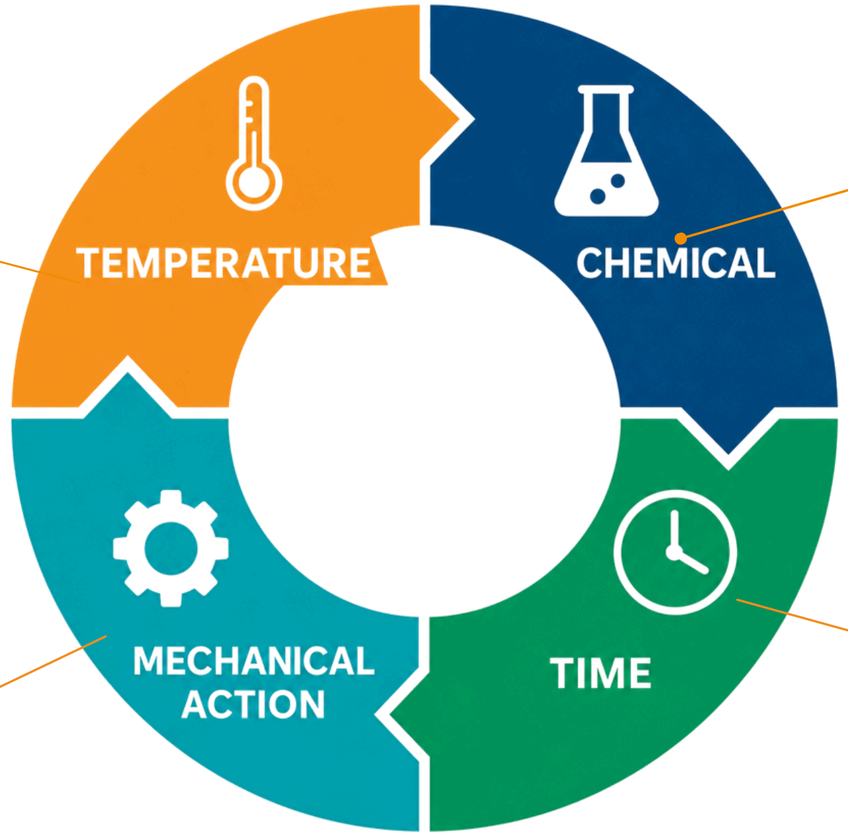
DISHWASHERS

APPLICATIONS,OPERATION AND WATER TREATMENT PROCEDURES



The **four** essential elements for effective **manual** or **mechanical washing**:

Promotes the dissolution of dirt and the activation of detergents



The type and concentration of the detergent product used

The energy applied to remove dirt, such as manual scrubbing, the use of brushes, or water pressure

Cycle duration required for an optimal result

WASH PHASE PARAMETERS

Phase	Temperature	Time	Chemical Action	Mechanical Action
PRE-WASH	30°-45° C (water)	10"-25"	-	AVERAGE
WASH	55°-65° C (water + detergent)	90"-180"	HIGH ALKALINITY	HIGH
RECIRCULATED RINSE	75°-95° C (water)	10"-15"	-	AVERAGE
RINSE	75°-95° C (water + rinse aid)	10"-25"	HIGH	LOW
DRYING	45°-75° C (air)	10"-15"	-	LOW

COMPLETE MECHANICAL WASH CYCLE

The complete mechanical wash cycle consists of:

MANUAL OPERATIONS

- Cleaning (or scraping)
- Soaking
- Dish positioning

MECHANICAL OPERATIONS

- Pre-wash
- Washing
- Recirculated rinse
- Rinse
- Drying

THE IMPORTANCE OF WATER

Washing effectiveness depends not only on chemistry, but on how water interacts with it.

Here are its three functions:

01

It acts and carries the active components of the detergent directly onto the dirt surface

02

It keeps the removed particles in suspension, preventing them from redepositing on the dishes or clogging the machine's circuits

03

In the final phase, together with the rinse aid, it erases all traces of detergent, ensuring safe and shiny surfaces

The washing process is better with water hardness above 8°F (optimal temperature 12-10 °F)

CHEMICAL ACTION

DETERGENT (Alkaline Product)

It is used to create an alkaline environment in the wash tank and to sequester the limescale particles present in the wash water.

A good dishwasher detergent must have the following characteristics:

- Dissolve quickly in water
- Remove all types of dirt in a short time
- Not produce excessive foam
- Ability to operate even in very hard water
- Not corrode the metal parts of the machine
- Not affect the enamel and decorations of the dishes
- Not have irritating or poisonous effects

RINSE AID (Acid Product based on Surfactants)

It is used in the final rinse phase and is dosed with very high temperature water (75°-95°C).

The action of the rinse aid consists of:

- Eliminating calcium streaks on dishes
- Significantly reducing drying times, as it makes total evaporation faster

SANITIZER

Used to sanitize dishes in low-temperature dishwashers (in high-temperature machines this function is performed by the high temperature itself).

Usually, it is a chlorine-based product.

CLASSIFICATION OF DISHWASHER SYSTEMS



SINGLE TANK

Equipped with a single tank containing water and detergent.
Dishes are placed in a single basket and the wash cycle takes place sequentially.

- Glasswashers
- Hood type

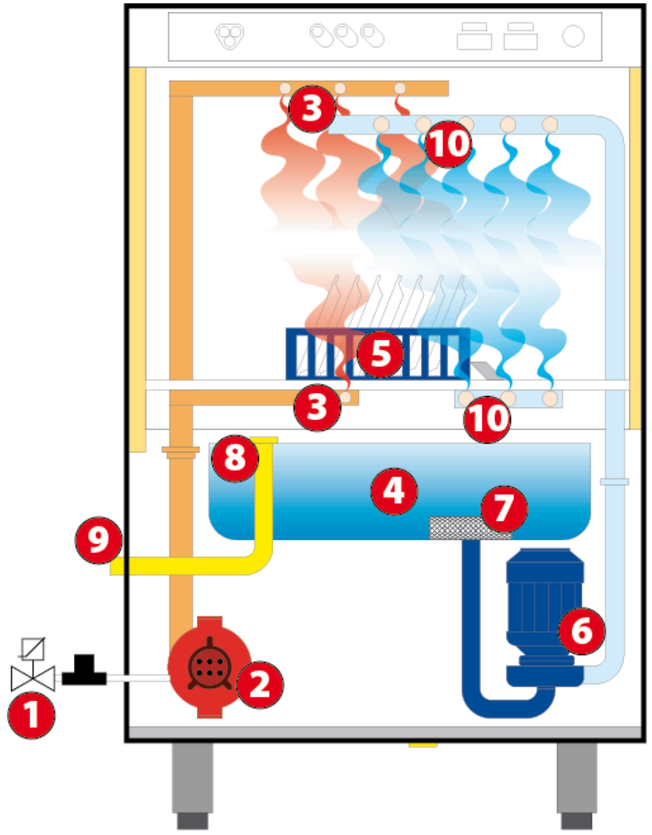


TUNNEL OR CONVEYOR MACHINES

The dishes are distributed over several baskets that advance inside the machine via a continuous transport system.
The machine operates constantly and allows simultaneous execution of different phases of the wash cycle, for example washing in one section and rinsing in another.
Furthermore, it is equipped with multiple tanks, from which the pumps draw the detergent solution necessary for the various cleaning phases.

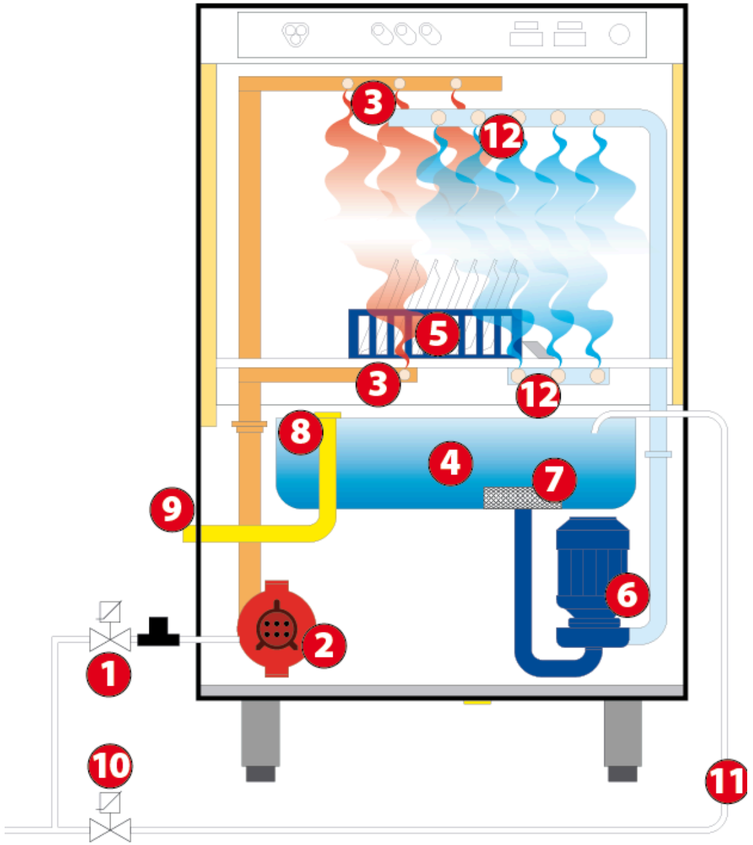
- Rack conveyor dishwashers
- Flight-type dishwashers

FIXED CYCLE DISHWASHER DIAGRAM WITH 1 S.V.



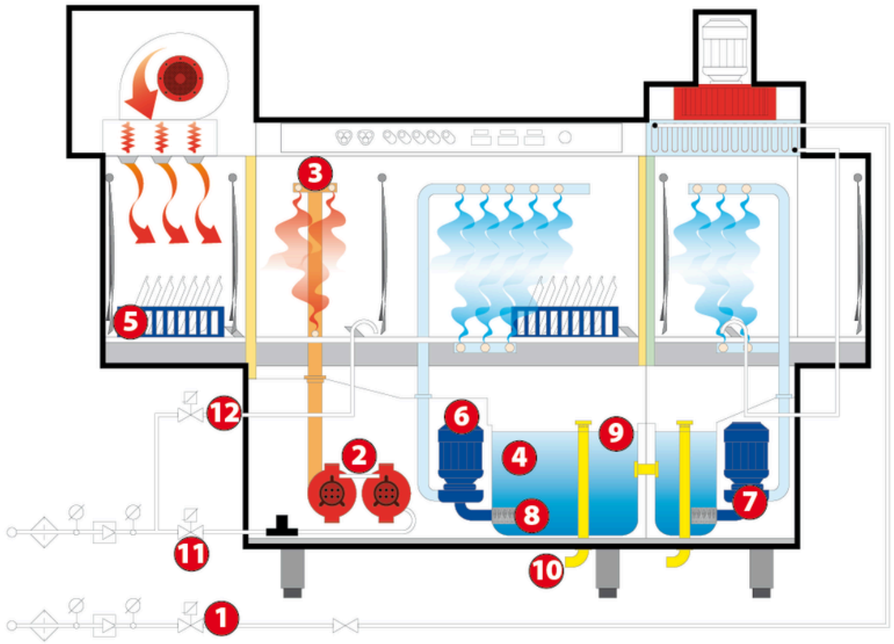
1. Solenoid valve
2. Boiler
3. Rinse nozzles
4. Washing tub
5. Dish basket
6. Wash pump
7. Filter
8. Cap/overflow
9. Exhaust pipe
10. Rinse nozzles

FIXED CYCLE DISHWASHER DIAGRAM WITH 2 S.V.



1. 1st load solenoid valve
2. Boiler
3. Rinse nozzles
4. Washing tub
5. Dish basket
6. Wash pump
7. Filter
8. Cap/overflow
9. Exhaust pipe
10. Flush solenoid valve
11. Filling tube
12. Washing nozzles

TUNNEL DISHWASHER DIAGRAM



1. 1st load solenoid valve
2. Boiler
3. Rinse/wash nozzles
4. Washing tub
5. Dish basket
6. Wash pump
7. Pre-wash pump
8. Filter
9. Cap/overflow
10. Exhaust pipe
11. Flush solenoid valve
12. Filling tube

DOSING THEORY

FIXED DOSING

Pump flow rate cannot be modified:

- No one can change the dosage
- It is not adaptable to different dosing needs
- It is almost impossible to find the required flow rate

VOLUMETRIC DOSING

Dosing lasts for as long as the pump is powered, maintaining a concentration equal to:

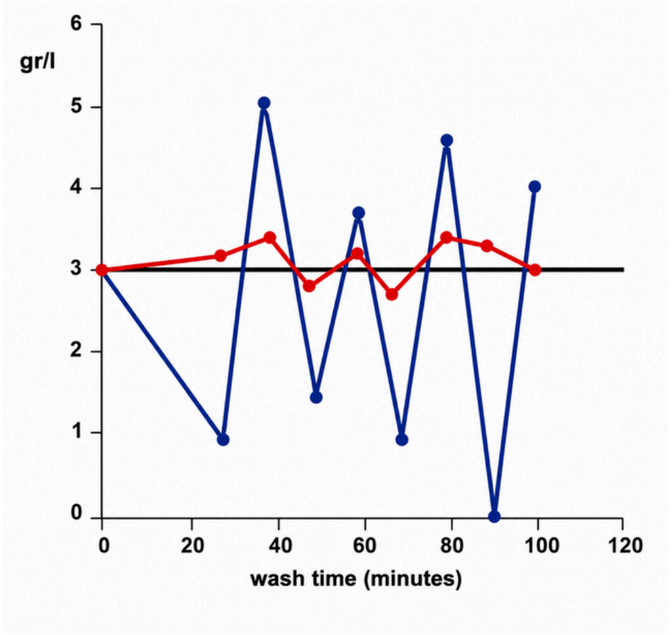
- Pump flow rate
- Water flow rate
- The flow/pump parameter is variable with a regulator

TIMED DOSING

- Knowing the dispenser flow rate, an exact dosage can be set, which does not depend on other factors (e.g., water flow rate in the initial fill)

CONDUCTIVITY DOSING

- Checking the water conductivity "ensures" that the set detergent concentration is in the tank, without depending on water flow rates or the amount of dirt
- It is the only system usable for dosing powders



MANUAL DOSING

AUTOMATIC DOSING

OPTIMAL CONCENTRATION

MAINTENANCE AND TROUBLESHOOTING

To ensure an optimal result, it is essential to understand and monitor the two main phases of the dishwasher: washing and rinsing

WASH PHASE

For this phase to work correctly, the operator must always verify that:

- The machine's motor and pump operate without anomalies
- The wash arms do not have blockages
- The sprayers are perfectly clean

RINSE PHASE

Unlike the wash, this section is not equipped with pumps or filters, making it very easy to check. The key points to inspect are:

- The absence of obstructions in the sprayers
- The correct mains water pressure
- The proper directing of the nozzles

MAINTENANCE AND TROUBLESHOOTING

If you notice too much foam in the wash tank, it is necessary to immediately verify these two scenarios:

FOAM

- Rinse aid was added during the fill phase and the wash phase started when the temperature was still too low (less than 60°C).
- During manual pre-wash, residues of hand detergent remained on the dishes. This product creates foam if agitated inside the dishwasher.

TEMPERATURE

- If too low, they cause insufficient washing and no guarantee of accurate sanitization, even in the rinse phase
- Excessive temperatures cause thermal setting of proteins and organic residues, hindering the subsequent removal phase
- If too high (100°C), rinsing is insufficient, as water and steam come out of the nozzles

Problems related to grease accumulation and stubborn dirt residues:

GREASE

It forms a film that floats on the water and should normally flow out of the overflow. If the overflow is clogged, the water level rises and prevents this grease film from escaping, dirtying the dishes again.

DIRT

If you still find dirt on the plates at the end of the cycle, the preliminary scraping was insufficient or the machine's drain has problems.
Basic rule: always prevent dirt from becoming too dry before washing, always performing the soaking phase.

MAINTENANCE OF DOSING SYSTEMS

Correct chemical dosing makes the difference. Therefore, it is necessary to periodically carry out these checks:

ELECTRICAL CONNECTIONS

Ensure that the systems are regularly plugged in and powered

PRODUCT LEVEL

Verify that the detergent/rinse aid in the canister is sufficient and proceed with replacement if not.

HYDRAULIC SYSTEM

Check that the dosing circuit is not empty or drawing in air; if necessary, prime the dispenser

CLEANING

Ensure that the dispenser filter is not clogged and that the product injection fitting is free from obstructions


INJECTA
the perfect dosing