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***AUTOMATED MODULAR  
SYSTEM  
FOR INTERIOR WASHING  
OF FOOD-GRADE TANK  
TRAILERS***



## ***1. System performance***

This compact modular food-grade system enables users to perform fully automated interior washing of tank trucks and trailers used for transportation of various liquid food products and beverages, such as juices, milk, food oils, liquefied yeast, liquors, etc. The system allows the operator to select one of eight types of automated washing cycles suited each for different food products transported by tank trucks.

One such unit is able to wash up to 20 tank trailers per day, depending on the carried food product.

Two such washing units can be installed side by side (as shown in Photos 1a and 1b), doubling the throughput, while being controlled by one person from a single operator platform.



***Photos 1a and 1b. General views of automated washing system for two tank trailers***

## ***2. System certifications***

All piping, pumps, connections and fittings in this system are made from materials approved for use in the food industry, mainly from food-grade stainless steel.

This system is fully compliant with the requirements of the US Department of Agriculture and Juice Products Association and with the 3A requirements for washing equipment for tanks used for transportation of pasteurized milk.

This system is also approved and certified for food-grade tank washing by the following food and beverage companies: Coca Cola, Nestle, Arrowhead, Calistoga, Juicy Juice, Minute Made, Ocean Spray, Odwalla, Vitel, Cardill Juice, and Sunkist. In addition, this is the only food-grade tank washing system certified by the Florida Citrus Processors Association.

These certifications confirm high quality of the design, construction, and performance of this system. Certification by Sunkist company shows that this system is compliant with the requirements for washing of tanks used for transportation of kosher products.

### ***3. System operation***

Two people are required to operate this system, one operator and one supporting person to install auxiliary equipment and connect hoses.

Control panel is located on the service platform (see Photo 2a), allowing the operator to communicate directly with the supporting person. Operating the system does not require any previous experience. Two-day training program allows the personnel, upon completion, to operate the system with no supervision.

Automated washing cycle is controlled by programmable controller, eliminating possible operator errors. Operator determines the type of the food product carried by the tank trailer and enters it using the control panel touch screen with control buttons on its top (see Photo 2b). Then the system performs fully automated washing cycle designed specifically for this food product.

All major parameters (such as temperature and level of washing liquids in the tanks) are displayed on the operator screen, as well as the current state of the equipment (pumps, automated valves, etc.). If emergency conditions are detected, alarm message will be displayed on the screen, along with a possible operator action to resolve it. Control panel is equipped with a device recording the operator input and washing process in real time.



***Photos 2a and 2b. Control panel and touch screen***

After the tank trailer is set for washing, the top manway is opened and a special manway adapter is installed (see Photo 3a) with washing head attached to it. Roll-out gangway with adjustable height is used to install the manway adapter (see Photo 3b).

After manway adapter is installed, hoses delivering washing liquid and vent flex ducts are connected to it, and draining hoses are connected to the tank trailer.

Washing liquids are fed under high pressure to the washing head. The orbital washing head (see Photo 4) is rotating around the horizontal and vertical axes and is driven by pressure of the washing liquid (see Pictures 1a and 1b). Pattern formed by the water jets covers all interior surface of the tank.





*Photos 3a and 3b. Manway adapter installed on in top manway of tank trailer and adjustable gangway platform for installation of manway adapter.*

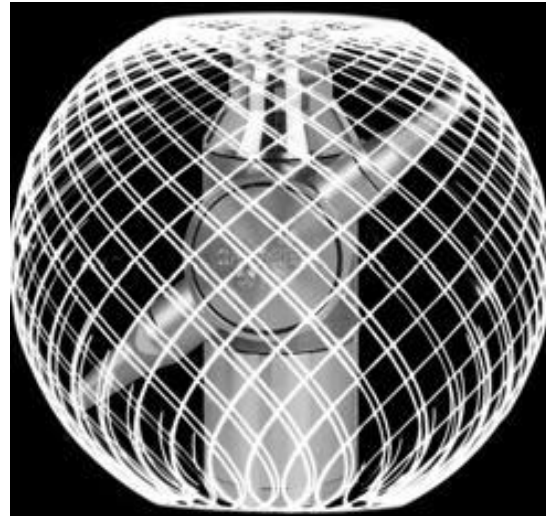
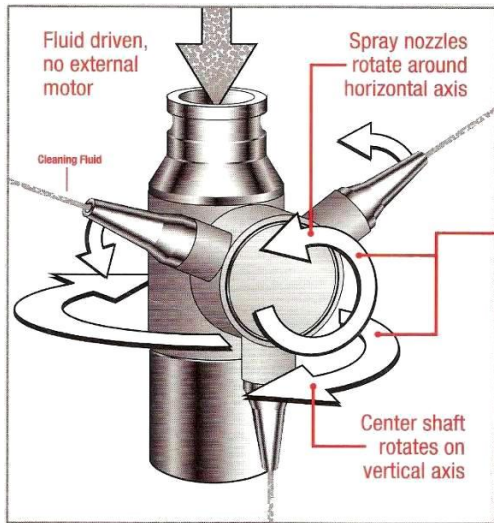


*Photo 4. General view of orbital washing heads with three or two nozzles*

The tank trailer interior is washed with hot washing solution and then rinsed with cold water. If necessary, disinfecting solution is also applied.

After rinsing, the tank can be dried by hot air, if needed. Finally, the tank is cooled to ambient temperature, hatches are closed and seals are installed.

Vapors and vent gases are evacuated from the washed tank by the draft fan.



*Pictures 1a and 1b. Principle of action of orbital washing head*

#### ***4. Factory ready modules***

All equipment is grouped in modules mounted on frames (see Photos 5 and 6). This allows easy transportation without damaging the equipment. When modules are delivered to the site, they can be easily assembled utilizing easy access to piping and cable connections. Time required to complete the assembly is less than a week.



*Photos 5 and 6. System main module and boiler module*

The washing system is equipped with boiler module (steam generator), along with the water filtering and softening unit to feed the boiler with water cleaned of solid particulate and dissolved salts. Clean steam from the boiler is used in the compact heat exchanger allowing the washing liquid to be heated up to 195°F.

This system is also equipped with air-drying unit to dry tanks by hot air, that is usually needed for tanks used for transportation of refined food-grade oils.

## ***5. Warranty***

The system is covered by 12 months warranty starting from the system startup but not more than 18 months from the day the system is shipped, whichever comes first.

## ***6. Delivery time***

The system delivery time is 7 months starting from the date the first payment is received according to the contract signed.

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