

End of Line System

for functional and safety testing of washing machines



Technical information

The End of Line System is used for the complete functional testing of washing machines, including a norm-compliant safety test. The system is divided into four basic functional areas that are interlinked with an automatic transport system and approached one after the other. The washing machine is transported on a special workpiece carrier. An RFID system installed in the workpiece carrier ensures the identification of the washing machines in the system.

General information

- Line control completely via Elution® software
- KUKA robot (subordinate to the Elution® software)
- AOI system (subordinate to the Elution® software)
- Conveyor control with SIMATIC S7 (subordinate to the Elution® software)



AOI Robot-VISION System

Automatic optical inspection system for the oscillating system and washing machine housing.

- The system contains a robot (mounted on the ceiling) that moves to various predefined positions and takes pictures "on the fly" with special cameras.
- The images are compared with reference images at runtime and evaluated as OK or not OK.



End of Line System

Station 1: Starting station

- Pre-filling with water via the rinsing tray
- Contacting mains supply
- Contacting PE probes on motor / heater, front of housing
- Flow measurement
- Belt tension measurement at drive belt
- PE testing at various positions

Station 2: Home Connect Station

- Scan of a label on the top of the test object
- Contacting mains supply
- Activation and test WiFi (Home Connect)

Station 3: First Functional Test Part I

- Filling with water via the hose connection
- Contacting mains supply
- Adaptation of water drainage on the workpiece carrier
- Adaptation cold and hot water at the washing machine
- Adaptation of water inlet for AquaStopp
- AquaStopp test
- Measurement of cold and hot water flow
- Measurement of water temperature at inlet
- Measurement of water pressure at inlet
- Leak test at the outlet system
- High-voltage test
- Leakage current test

Station 4: Second Functional Test Part II

- Contacting mains supply
- Adaptation of water drain on workpiece carrier
- Suction of residual water
- Rotational speed measurement
- Rotational direction measurement
- Checking the V-belt position
- Drum lighting check
- Display check (vision check)

Station 5: Door Open Station

- Contacting mains supply
- Check whether safety switch for "door open" is triggered



Line Audit

- Four individual test stations centrally controlled by the Elution® software
- Completely manual contacting and adaptation
- A certain percentage of the daily production quantity of washing machines is taken out of circulation for endurance tests and subjected to a long-term test in the line audit.