Drum Washing Machine Assembly Line

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1. Overview: From Washing Machine Types to Assembly Solutions

In the home appliance manufacturing sector, washing machines are primarily categorized into two structural types: **top-load (pulsator) washing machines** and **front-load (drum) washing machines**.

Top-load washing machines rely on a pulsator at the bottom of the tub that rotates clockwise and counterclockwise to create water flow. Cleaning is achieved through friction. These machines have a relatively simple structure—essentially a single inner drum with a top-opening lid—resulting in

fewer assembly steps and a straightforward production process.

Front-load (drum) washing machines, by contrast, feature a horizontally mounted drum. During operation, clothes are lifted by the drum wall and then dropped by gravity, achieving cleaning through a “drop-and-beat” mechanical action. Compared to pulsator models, drum washing machines incorporate additional components: concrete counterweights, a shock absorption system, a door seal (gasket), a heating element, and a door lock mechanism. The finished unit is significantly heavier (typically 60–80kg net weight) and involves more complex assembly processes. This demands higher load-bearing capacity, positioning accuracy, and electrical testing capabilities from the **drum washing machine production line**.

To meet these specific structural and assembly requirements, our **drum washing machine assembly line** is engineered to handle the complete manufacturing cycle—from chassis loading, inner drum assembly, and cabinet enclosure, to counterweight installation, pipe routing, electrical wiring, door assembly, functional testing, and final packaging.

2. Assembly Process Details: Precision Engineering for Drum Washers

Chassis & Inner Drum Pre-Assembly

On the pre-assembly station, shock absorbers (4 sets), the inner drum assembly, the motor, and the pulley are mounted sequentially onto the chassis fixture. Motor fastening is performed using torque-controlled pneumatic wrenches with a setting range of **8–12 N·m**, ensuring consistent belt tension across all units. Once completed, a lift transfer mechanism moves the chassis assembly to the main **washing machine conveyor line**.

Cabinet Enclosure & Alignment

The outer cabinet (sheet metal or PP plastic) is hoisted—either manually or with a balancer arm—and fitted over the positioned inner drum assembly. Positioning fixtures on both sides of the **drum washer assembly line** ensure coaxial alignment between the cabinet and chassis, with a deviation of **≤ 1.5mm**. After alignment, side-panel connecting bolts are fastened using automatic or manual screw machines at **5–8 N·m** torque.

Counterweight & Pipe Routing

Top and front concrete/cast-iron counterweights (single block weight: **15–25kg**) are assisted into position using spring-balanced lifting arms. Fastening bolts are tightened to **15–20 N·m**. Inlet hoses, drain pump pipes, power cords, and ground wires are then connected. All tubing and wiring are secured with clips at intervals of **≤ 150mm** to prevent vibration-induced wear.

Door Assembly

After installing the front door hinge and glass assembly, technicians adjust the door-to-cabinet gap to a uniform **3–5mm** on all four sides. The door lock connector is plugged in and pressed firmly into place using a dedicated jig.

End-of-Line Testing (EOL)

Fully assembled units enter the testing station for a comprehensive quality check:

- **Ground Resistance Test**: Test current 25A, resistance **≤ 0.1Ω** (Pass).
- **Dielectric Withstand (Hipot) Test**: AC 1250V / 1min, leakage current **≤ 5mA**.
- **Functional Test**: Live power verification of water inlet, drain, motor forward/reverse, heating element (resistance check), and door lock continuity.
- **Noise & Vibration Test**: Conducted in a soundproof test room (background noise **≤ 35dB(A)**). The unit runs at 800 / 1200 / 1400 rpm. Pass/fail criteria follow the client’s specific quality specifications.

Packaging & Off-Line

After passing all tests, the unit is automatically wrapped in PE film. Accessories and user manuals are inserted manually, followed by automatic carton folding, sealing, and strapping. Finished products are conveyed via roller line to the palletizing area or AGV docking station.

3. Technical Specifications: Drum Washing Machine Assembly Equipment

Parameter	Specification
Conveyor Type	Twin-speed chain / Slat chain conveyor (optional)
Total Line Length	30m / 40m / 60m (customized by station count)
Line Width	1200mm (effective conveying surface: 800mm)
Number of Stations	16–24 stations (pre-assembly, main assembly, testing, packaging)
Station Pitch	2000mm
Conveyor Speed	0–5 m/min, VFD stepless speed regulation
Max. Load Capacity	≥ 120kg per station
Positioning Accuracy	Work pallet stop position: **±3mm**
Drive Power	2.2kW (main line), 1.5kW (pre-assembly line)
Operating Voltage	AC 380V, 3-phase 5-wire, 50Hz
Air Supply Pressure	0.5–0.7 MPa, G1/2″ interface
Pneumatic Tool Consumption	Approx. 200L/min (total line)
Ground Resistance Tester	Range: 0–200mΩ, Accuracy: ±1%
Hipot Tester	Output: 0–5kV AC, Accuracy: ±2%
Noise Test Room	Background noise ≤ 35dB(A), Frequency response: 20Hz–20kHz
Control System	PLC + HMI (brand optional), with photoelectric sensors, emergency stop circuit, and audible/visual alarms
Takt Time / Cycle Time	30–60 seconds per unit (adjustable based on configuration)
Applicable Models	Drum washing machines, capacity 6–12kg; Unit dimensions: 595–600mm (W) × 450–650mm (D) × 840–850mm (H)