Assembly Conveyor Line

1. Working Process

The assembly conveyor line adopts a modular assembly line layout design, with continuous or intermittent smooth conveying as the core process, fully conforming to the operation rhythm of manual assembly stations, automated assembly equipment, detection instruments, and packaging equipment, achieving precise material flow and synchronous operation of stations. The overall process follows the standardized process of "feeding and conveying station positioning segmented assembly detection and transportation finished product offline", and can flexibly adjust the operation mode and conveying rhythm according to different assembly scenarios, adapting to various process requirements such as single piece flow, batch assembly, and stacking pause.

According to different material characteristics, various conveying forms are matched with dedicated assembly processes: Belt conveyoris mainly used for smooth conveying of lightweight precision components and small finished products, with no vibration or scratching during operation, suitable for precision assembly applications in electronics, appliances, and light industry; Roller conveyor focuses on straight-line transfer of heavy boxes, pallet-loaded workpieces and large accessories, with strong load-bearing capacity, suitable for large-scale assembly in machinery and home appliances; Chain plate and chain conveyors provide both high load capacity and long distance conveying, with sturdy structure capable of withstanding continuous heavy-duty operations, suitable for heavy-load assembly in automotive parts, hardware machinery, etc.; Mesh belt and chord chain conveyors feature good flexibility and easy cleaning. The former is suitable for ventilation-required, light-load assembly stages, while the latter is suitable for irregular workpieces and clean room assembly scenarios, avoiding material jamming and collision. The entire line can be equipped with auxiliary mechanisms such as lifting & transferring, curve connection, and lifting & speed adjustment, achieving multi-line connection, material directional conveying, meeting the three-dimensional, multi-station process layout requirements of complex assembly workshops.



2. Core Parameters

Conveying Form: Roller conveyor, belt conveyor, chain conveyor, mesh belt conveyor, chain plate conveyor, chord chain conveyor, supporting various line structures such as straight type, curved type, lifting type, and closed-loop type. Customized compositetype lines can be provided

Applicable Materials: Various lightweight precision electronic components, small and medium-sized home appliance accessories, heavy machinery parts, box pallet-type workpieces, irregular assembly semi-finished products, etc. Single-station load capacity range is 1kg-2000kg, with overweight load capacity specifications available for customization

Line Width: Standard width is 150mm-2000mm. Non-standard sizes can be customized according to needs up to 3000mm, fully matching the material outer width and assembly station operating space

Conveying Speed: 0.3m/min-25m/in, using variable frequency stepless speed regulation system. Speed can be freely adjusted according to assembly rhythm, supporting multiple modes such as constant speed operation, intermittent start-stop, and accumulation positioning and station positioning

Line Length: Single section standard length is 3m-50m, which can be seamlessly spliced on-site for extension. The longest can achieve hundreds of meters of long-distance conveying, adapting to different workshop actual layouts and station quantities

Drive mode: motor drive (brand variable frequency motor), matched with gearbox, sprocket, drum and other transmission components, stable operation without noise

Running Power: 0.55kw-11kw, precisely matched according to line length and load weight. Energy-saving and efficient, suitable for long-term continuous industrial operations

Control Method: PLC intelligent control, standard equipped with operation panel, emergency stop button, and speed regulation switch. Can connect with workshop MES system, and automated assembly robots to achieve intelligent linked control

Working Environment: Temperature -10 to 60 degrees Celsius, Humidity 10%-90% without condensation. Can adapt to various environments such as standard workshops, 、Dust proof workshop、 and light clean rooms. The main frame can be treated with rust-proof and anti-corrosion processes

Positioning Accuracy: Intermittent station positioning accuracy can reach plus or minus 1mm, meeting high precision requirements for precision assembly and fixed-point inspection

3. User Guide

1. Installation and Debugging: The assembly conveyor line adopts a prefabricated modular structure. Core components are assembled before shipment, and only splicing, fixation, wiring and debugging are required on-site. No complex civil construction is needed, making installation convenient and efficient. Before installation, it is necessary to ensure the ground is level and flat, and reserve power interfaces (380V three-phase power is the main requirement, while some lightweight lines can use 220V) , After installation, perform no-load trial operation first to test the line running smoothness, speed regulation sensitivity, and positioning accuracy, then perform load test to calibrate all parameters to meet assembly process requirements. Formally put into production after acceptance qualification.

2. Daily Operation Specifications: Operators must be familiar with the line control process, emergency stop device locations, and speed regulation operation methods before starting work. Before starting, first check whether the conveying surface and transmission parts (rollers, chains, belts, etc.) have foreign objects or jams. Start the power supply after confirming no abnormalities. During operation, materials must be placed properly to avoid material bias or overloading by stacking. Irregular workpieces must be fixed in place to prevent deviation or falling during conveying; If the line needs to be paused for station assembly, the intermittent mode can be switched to. It is strictly prohibited to extend hands or tools into the line transmission area during operation to avoid safety hazards. When stopping the machine, the line must complete no-load operation first, remove surface debris, and then turn off the control switch and main power supply.

3. Maintenance:Daily Maintenance: Clean dust, component debris, and oil stains from the line surface daily. Keep the conveying surface clean to avoid debris jamming the transmission parts. Check motor, bearings, chains, and belts tightness weekly, and promptly clean debris from roller gaps to ensure smooth transmission. Regular Maintenance: Apply specialized lubricating oil to bearings, chains and other rotating parts monthly. Check if circuit connections and control switches are intact. Calibrate conveying speed and positioning accuracy. Conduct comprehensive inspection of line frame and support brackets quarterly. Replace severely worn belts, chains and other wearing parts to extend line service life. When stopping for long periods, dust-proof and moisture-proof protection must be done, with protective film covered to avoid component rust and dust accumulation.

4. Safety Precautions: Non-professional operators are prohibited from starting, debugging, or disassembling line components without authorization; Overloading and biased loading of materials are strictly prohibited to avoid damaging the transmission structure and motor. When the line is running, it is prohibited to cross or climb the line, and place unrelated items on the conveying line. For lines equipped with protective railings, the protective devices must not be arbitrarily removed; If abnormal conditions such as strange noises, jams, or overloads occur during operation, immediately press the emergency stop button and cut off power before troubleshooting. Operating with faults is prohibited.

Beijing Lifeng Zhitong Environmental Technology Development Co., Ltd.

4. Product Advantages

Extremely Strong Scene Adaptability: Six major mainstream conveying forms are fully covered. Materials can be precisely matched according to weight, size, and assembly process requirements. Solutions are available for lightweight precision parts, heavy-duty large parts, and irregular workpieces, taking into account various workshop layouts and assembly rhythms. Conveying forms can be adjusted without replacing the entire line.

Stable Operation with High Precision: Made with high-quality national standard steel frame, paired with brand transmission and control components. Operation is stable without vibration or noise. Intermittent positioning is precise, effectively avoiding material collision and scratching during assembly, ensuring product assembly quality. Can 24 hours of continuous uninterrupted operation, meeting mass production demands.

High level of automation and flexibility: supporting functions such as variable frequency speed regulation, intermittent start stop, accumulation and positioning, intelligent linkage, etc., it can be connected to automated assembly robots, testing equipment, and packaging machines to achieve unmanned transportation and assembly, reducing manual handling costs; Modular design supports later expansion, transformation, and relocation, adapting to enterprise capacity upgrades and process adjustments.

Durable Structure and Easy Maintenance: The main line body is treated with rust-proof reinforcement. Conveying parts are made of wear-resistant, anti-aging materials with long service life. Standardized wearing parts have low replacement cost and simple operation. Daily maintenance does not require professional technicians, greatly reducing later operation and maintenance costs.

Significant Production Efficiency Improvement: Replaces traditional manual handling and transfer, breaking through bottlenecks in assembly process connections, reducing process waiting time and optimizing station workflow. Makes the assembly process smoother. Compared to manual mode, production efficiency can be improved by 30%-60%, while reducing manual error rate and improving product qualification rate.

Complete Safety Configuration: Standard equipped with emergency stop button, overload protection, protective railings and other safety devices. Complies with industrial

production safety standards with low operation threshold, fully ensuring operator personal safety and avoiding production safety risks.

5. Applicable Industries

Widely applicable to assembly workshops of various manufacturing enterprises, covering all fields of light industry, heavy industry, and precision manufacturing. Including **electronics and appliances, home appliance manufacturing, automotive and parts, hardware machinery, new energy, light industrial daily products,** medical devices and food packaging, building materials and home furnishings, and other fields.

Beijing Lifeng Zhitong Environmental Technology Development Co., Ltd.