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## Releasing the YD Series A New Model of the Flagship YC Series Take-Out Robots

- Yushin Precision Equipment •

YUSHIN PRECISION EQUIPMENT CO., LTD. (President: Takayo Kotani, Headquarters: Kyoto, Japan, Capital: 1,985.66 million JPY), a manufacturer specializing in product take-out robots for plastic injection molding machines, is releasing the YD series on November 1, 2021. This is the first model change of the YC series in about ten years.

The YD series has a wide range of product lineup for target injection molding machines with a mold clamping force in the range of 30 to 1,300tf. The YD series is also provided with many new features and equipment in response to the customer needs, contributing to improved productivity and profitability.

### New Product Features

#### 1. Enhanced Features \*

The YD series focuses on four themes: improved productivity, teaching abilities (for enhanced operability and production efficiency), reduced downtime, and environmental responsiveness (reduced ecological impacts). The YD series is provided with 15 built-in enhanced features to demonstrate the four themes.

\* Enhanced refers to improved, more advanced, or stepped-up

### Enhancement of Productivity

#### (1) CFRPv3

The adoption of CFRPv3\* has improved the bending rigidity of the robots by 46% compared to the YC series, realizing a 13% reduction in the arm's vibration amplitude. Due to the stable operation with reduced vibration, the YD series has less chance of scratching the

product or making errors during the work take-out process, resulting in improved productivity.

\* The third generation CFRP was made by modifying the CFRP used for the YC series

(2) All-Axis Optimum Vibration Control [PAT.]

The YD series has an enhanced vibration control feature by adding the vibration control used only for the kick axis to the transverse and vertical axes. This feature reduces waiting time (timer) in the work take-out operation and many other situations such as the work releasing and receiving operations, helping to reduce the cycle time.

Enhancement of Teaching Abilities (Excerpt)

(1) Cycle Up Feature [PAT.P]

This feature displays in list form the time required for the take-out robot to operate in each step. The feature helps improve productivity by visualizing the sections where reducing the cycle time is possible.

(2) Manual Torque Monitor

This feature allows the operator to monitor and fine-tune slight torque fluctuations while looking at the visualized torque gauge assigned to each axis. When performing a challenging teaching operation such as insert molding, this feature helps the operator fine-tune slight torque fluctuations while monitoring them at the same time.

Enhancement of Downtime Reductions (Excerpt)

(1) Take-Out Diagnosis Feature [PAT.P]

This feature constantly monitors the vacuum pressure during the take-out operation and automatically identifies pressure patterns, helping to determine the cause of take-out failure.

(2) Vacuum Pressure Display

This display checks long-term changes in the vacuum pressure, helping the operator recognize the need to prevent take-out failure.

(3) Predictive Maintenance [PAT.]

While constantly monitoring the status of the take-out robot during operation, this feature sends a message upon detecting a sign that suggests possible failure. The feature has evolved from preventive maintenance to predictive maintenance over this model change.

(4) Manual Operation Torque Monitoring Feature [PAT.P]

This feature monitors the load applied to the take-out robot during a teaching operation to prevent damage due to an erroneous operation. With the load setting adjustable at three levels, this feature calls attention to the operator when the load exceeds one of the three levels by displaying a message on an alert screen and with a buzzer sound, preventing damage to the take-out robot and other equipment.

### Enhancement of Environmental Responsiveness

(1) Smart ECO Vacuum [PAT.P]

Evolving our proprietary ECO Vacuum™ has achieved a further reduction in air consumption. Smart ECO Vacuum optimizes the timing of vacuum start by constantly monitoring the vacuum pressure. As a result, air consumption has been slashed by a maximum of 78%, reducing electricity costs and CO2 emissions.

(2) ECO Monitor [PAT.]

This monitor displays the status of electricity and air consumption in real-time, contributing to energy saving measures on the plant floor.

(3) Ecology Mode

The take-out robot's speed in the transverse direction is automatically decelerated and adjusted in time for the molding cycle, resulting in a reduction in electricity consumption (by 5% according to our measurement). The ecology mode also brings about the extended service life of the guide shafts and timing belts, helping to reduce the running cost.

## 2. IoT Features

(1) Production Information Output

This feature can transmit information on the production monitor screen to the outside world via Ethernet communications. The

feature can output production and error information, enabling centralized information management within the customer's plant.

### 3. Cleanroom-Compatible Feature

#### (1) Cleanroom Specifications

The YD series is designed to minimize the amount of dust emitted from the take-out robot by mounting cleanroom-compatible cable carriers, the NSF-H1 certified grease (the standard grease used for food machinery in Europe), and grease anti-scattering covers. As a result, the YD series has achieved cleanliness levels equivalent to ISO Class 6 Cleanroom Specifications, making it suitable for use in clean environments in the medical and food industries.

The base prices of the YD series take-out robots follow in the order of the model, price, and mold clamping force of target injection molding machines (not including consumption tax): YD-0103D, 3.30 million JPY, up to 30tf; YD-0310, 3.60 million JPY, 30–100tf; YD-1025D, 4.00 million JPY, 100–250tf; YD-2535D, 4.30 million JPY, 250–350tf; YD2-3550D, 5.60 million JPY, 350–500tf; YD2-5080D, 6.40 million JPY, 500–800tf; YD2-80100D, 7.80 million JPY, 800–1,000tf; YD2-100130D, 8.50 million JPY, 1,000–1,300tf. YUSHIN expects to sell approximately 3,000 units a year.

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