SAILOR

Extraction Robot

# sigma A



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**Representatives**

●Please note that the specifications and other information within this catalogue may be revised without notice, due to our ongoing product research improvement efforts.

1909E1000SA

SAILOR

# Trusted Brand

A high rigidity of the main frame and each component produce the extensive lifespan, precision, speed and repeatability with maximum flexibility to the variety of take-out part.

sigma A

# Technology


**sigma A** series , the Sailor Global Standard Extraction Robot Equipped w ith various functions in response to customer request s.

- Durability
- Safety
- Operator Friendly

**sigma A** series

Standard Extraction Robot

**Sailor Standard Model**

- Take-out Dry cycle...Less than 1.0 sec
- Dry Cycle...Less than 6.0 sec

* In Sailor Standard Condition

Safety Design — Highly Reliable Anti-Crash System (Collision prevention function)

## Rack & pinion

Accurate & durable Linear Guide is used.
The rack-and-pinion mechanism with special surface treatment is featured on all axis.

The rack & pinion features high durability,excellent drive response and also maintained with their simple structure.
(excludes vertical telescopic model)

Mold change easily from 2 plate-mold to 3 plate-mold specification.

## Full-Color Wide Panel

The 7-inch-wide screen touch panel controller

The colorful wide screen controller is light-weight, sleek and operator friendly.

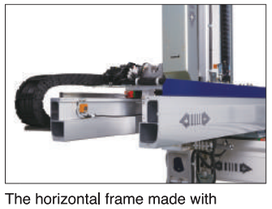


The touch panel features a convenience-oriented User Interface.

(see next page for details)
NEXT PAGE

Navy Blue

### Cross Section of Horizontal Frame



The horizontal frame made with optimal sectional shape gives it a high rigidity profile.

### Traverse Frame Structure


Composed by rigid material and structure. Designed for long lifespan and high durability.

## Color Variation (Option)

Forest Green


Sky Blue


Bordeaux Red

# Operator Friendly

## Large Screen Touch Panel

7-inch-wide color screen with WVGA (800X480) and 260,000 colors. We improved the resolution further with easy-to-identify icons, a touch switch with consideration to recognition, and a proper screen layout ensure reliable operability.
Available to set up 5 axes in one screen, access and switch to any other screen instantly through the menu bar.

## Multilingual

The language display supports 6 languages of Japanese, English, Korean, Thai, Chinese and Spanish.

# Touch Panel Controller


### USB Port

The pendant equipped with one USB port. Saving the mold data, alarm/operation history improves your factory productivity and process control. (USB memory stick not included)

### Cross-Keys

Utilizes Responsive Directional Control. It can control and operate each axis of the robot while teaching. Same cross-keys also show on the touch screen.

### Main Menu Screen

A new design of easy identify icons layout. Touch switches identified by color and shape with its different function in all screen.

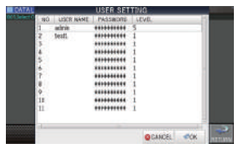
## Function List

### MyPro Function

When in need for a unique, outside of the default movements (pick and place position, timer, input/output), you can use the MyPro function to program your specific movements step by step. Able to setup Part-arm and Runner-arm separately, able to repeat number of times in-between steps.

### Login Function

One administrator and ten (10) users can be registered. Five stages of operation level can be set to each specific user.
＊2 stages setup of operation level is standard.



### Name Edit Function

Default names of teaching data and timer can be edited using screen keyboard. For factory who utilizes two or more different robots, change and unify the name of positions and timers should help operator for their easier recognize.

### Ten Key/Collision Prevention

The easy view display of each axis and setup range is organized for trouble-free operation. Input settings with the 10 key numerical pad. In addition, adjustment of the first digit can be easily set by the up/down keys. The Collision prevention function with the ability to automatically calculate the max/min values and alert operator to prevent collision when teaching.

### Help Function

Display the operator's manual. Includes help comments, handling explanation, trouble shooting and operation instructions. (pdf format)

### Screen Memo

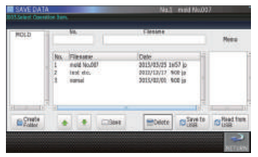
A display screen can be copied to a USB memory as a screen shot.

### Simulation Function

The content of the condition Teach setting is displayed in animation. Operation speed is adjustable by four stages. Simulation function brings you the operating confirmation, it is useful for preventing misconfiguration.

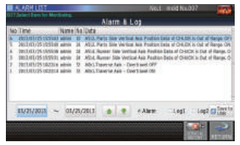
### Mold Data

Your important mold data can be saved by an easy organize File Manager Form. Available to input additional information regarding the mold. This mold data saving function play a role for mold changing and useful for improving efficiency.



### Alarm/Operation History

Alarm history and other log-in operating history records display are easy-view. To copy this record on to a USB driver is also possible. Operating long-in screen is optional, setup freely.



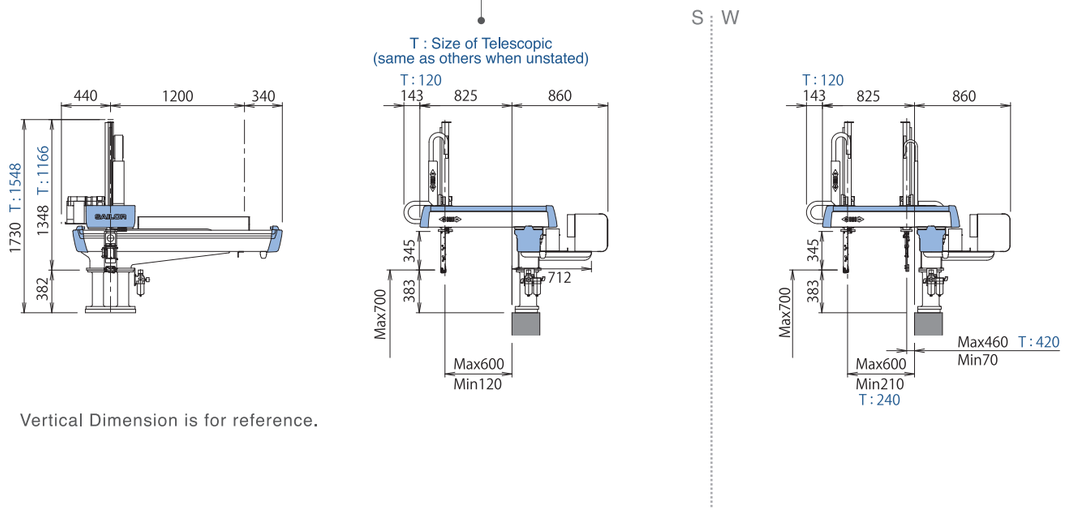
# SA-100

## Model Identification

SA - 100

| Series | Clamping Tonnage of Target Injection molding machine | No.of vertical guides | Unloading Direction | Type of vertical guide |
|---|---|---|---|---|
| | | S : Single Arm<br>W: Double Arm | R : Operator Side<br>L : Non Operator Side | No indication means Standard(single guide)<br>T : Telescopic Type with double guides |

## Measurement unit:mm




Vertical Dimension is for reference.

## Specification

| | |
|---|---|
| Power | AC200V±10% 50/60Hz 3φ |
| Maximum Electric Power Required | 2.8kVA |
| Normal Air Pressure | 0.5～0.6 MPa |

| | |
|---|---|
| Maximum Air Pressure Capacity | 0.97 MPa |
| Drive System | AC Servo Motor |
| Accuracy of Repeatability | ±0.1mm |
| Maximum Loading Capacity (including a chuck weight) | 8kg (with standard strokes & ThinA12 type wrist turn unit) |

＊Maximum loading capacities are our recommended value. Higher load than the indicated values are also possible with the adjustment of the operation speed.



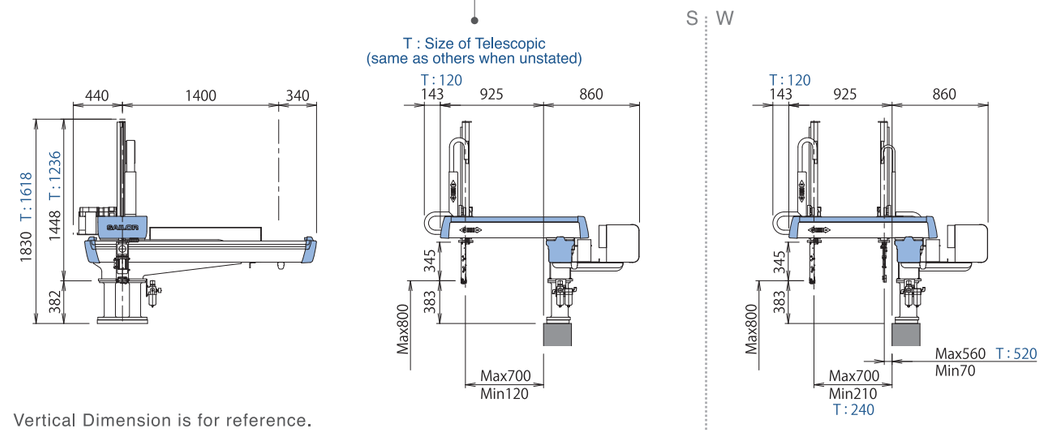
# SA-200

## Model Identification

SA - 200

| Series | Clamping Tonnage of Target Injection molding machine | No.of vertical guides | Unloading Direction | Type of vertical guide |
|---|---|---|---|---|
| | | S : Single Arm<br>W: Double Arm | R : Operator Side<br>L : Non Operator Side | No indication means Standard(single guide)<br>T : Telescopic Type with double guides |

## Measurement unit:mm




Vertical Dimension is for reference.

## Specification

| | |
|---|---|
| Power | AC200V±10% 50/60Hz 3φ |
| Maximum Electric Power Required | 2.8kVA |
| Normal Air Pressure | 0.5～0.6 MPa |

| | |
|---|---|
| Maximum Air Pressure Capacity | 0.97 MPa |
| Drive System | AC Servo Motor |
| Accuracy of Repeatability | ±0.1mm |
| Maximum Loading Capacity (including a chuck weight) | 8kg (with standard strokes & ThinA12 type wrist turn unit) |

＊Maximum loading capacities are our recommended value. Higher load than the indicated values are also possible with the adjustment of the operation speed.

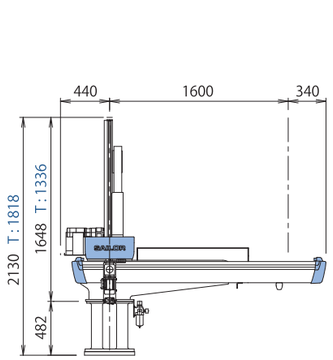
# SA-300

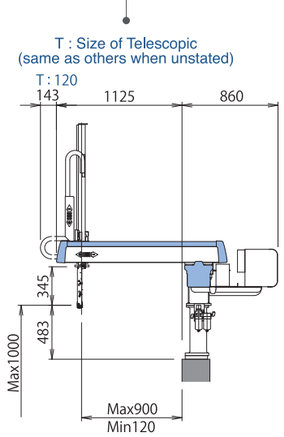
## Model Identification

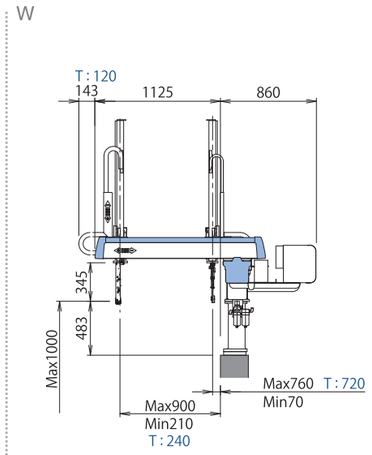
SA - 300

| Series | Clamping Tonnage of Target Injection molding machine | No.of vertical guides | Unloading Direction | Type of vertical guide |
|---|---|---|---|---|
| | | S : Single Arm<br>W: Double Arm | R : Operator Side<br>L : Non Operator Side | No indication means Standard(single guide)<br>T : Telescopic Type with double guides |

## Measurement unit:mm




Vertical Dimension is for reference.

## Specification

| | |
|---|---|
| Power | AC200V±10% 50/60Hz 3φ |
| Maximum Electric Power Required | 2.8kVA |
| Normal Air Pressure | 0.5~0.6 MPa |

| | |
|---|---|
| Maximum Air Pressure Capacity | 0.97 MPa |
| Drive System | AC Servo Motor |
| Accuracy of Repeatability | ±0.1mm |
| Maximum Loading Capacity (including a chuck weight) | 8kg (with standard strokes & ThinA12 type wrist turn unit) |

＊Maximum loading capacities are our recommended value. Higher load than the indicated values are also possible with the adjustment of the operation speed.



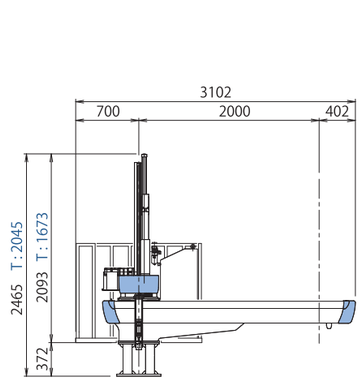
# SA-500

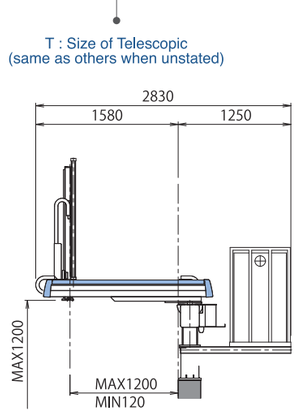
## Model Identification

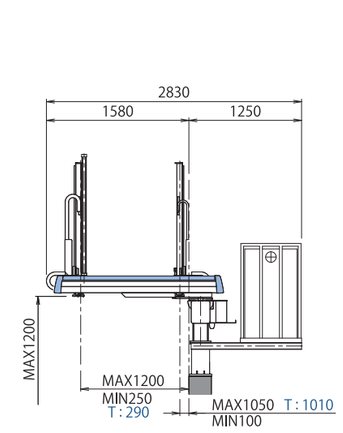
SA - 500

| Series | Clamping Tonnage of Target Injection molding machine | No.of vertical guides | Unloading Direction | Type of vertical guide |
|---|---|---|---|---|
| | | S : Single Arm<br>W: Double Arm | R : Operator Side<br>L : Non Operator Side | No indication means Standard(single guide)<br>T : Telescopic Type with double guides |

## Measurement unit:mm




Vertical Dimension is for reference.

## Specification

| | |
|---|---|
| Power | AC200V±10% 50/60Hz 3φ |
| Maximum Electric Power Required | 3.2kVA |
| Normal Air Pressure | 0.5~0.6 MPa |

| | |
|---|---|
| Maximum Air Pressure Capacity | 0.97 MPa |
| Drive System | AC Servo Motor |
| Accuracy of Repeatability | ±0.1mm |
| Maximum Loading Capacity (including a chuck weight) | 20kg(with standard strokes & ThinA12 type wrist turn unit) |

＊Maximum loading capacities are our recommended value. Higher load than the indicated values are also possible with the adjustment of the operation speed.

# SA-700

# Standard Specification Description

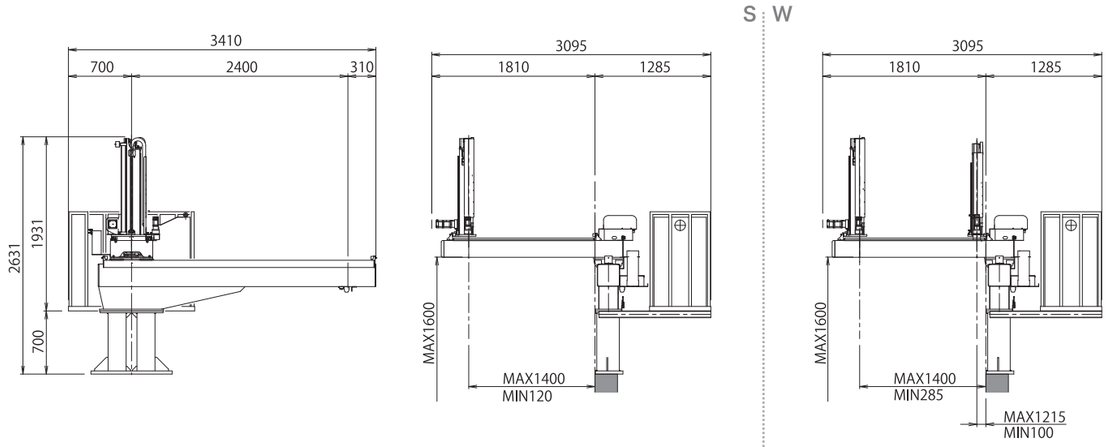
## Model Identification

SA - 700 □ □ T

- **Series**: SA
- **Clamping Tonnage of Target Injection molding machine**: 700
- **No.of vertical guides**: S : Single Arm / W: Double Arm
- **Unloading Direction**: R : Operator Side / L : Non Operator Side
- **Type of vertical guide**: T : Telescopic Type with double guides

*Telescopic type is standard for SA-700

## Measurement unit:mm




Vertical Dimension is for reference.

*SA-700 Cover design is different from other models.

## Specification

| | |
|---|---|
| Power | AC200V±10%　50/60Hz 3φ |
| Maximum Electric Power Required | 3.2kVA |
| Normal Air Pressure | 0.5～0.6 MPa |

| | |
|---|---|
| Maximum Air Pressure Capacity | 0.97 MPa |
| Drive System | AC Servo Motor |
| Accuracy of Repeatability | ±0.1mm |
| Maximum Loading Capacity (including a chuck weight) | 20kg(with standard strokes & AIII type wrist turn unit) |

*Maximum loading capacities are our recommended value. Higher load than the indicated values are also possible with the adjustment of the operation speed.

### 1 Flip-Turn Unit (Thin A12)

As the chuck stays standing up when taking out the parts from the mold, this unit is used to turn the chuck downward and then place the parts on a conveyor or auxiliary equipment.
The direction of the rotation axis is in horizontal.

### 2 Parts Vacuum Suction Detect Circuit

An air circuit, which consists of a vacuum generator (ejector) for suctioning the parts, and a related piping, and a pressure gauge, etc.

### 3 Parts Mechanical Chuck Circuit

An air circuit for mechanically holding the parts which consists of compressed air piping , solenoid valve, etc.

### 4 Orientation Control Position Setting

Setting of a position where Orientation control is performed for flip-turn and pivot-turn.

### 5 Priority Settings for Parts Reject/Runner Reject Position, and Vertical Position

Setting of the places and orders for dropping defective parts, runner and etc., for example, into a crusher.

### 6 Runner Traverse Discharge (Before or After Parts Unloaded)

Runner is discharged during a traverse stroke.

### 7 All Axis Parts Palletizing (999 positions for each axis)

For traverse axis, horizontal axis and vertical axis, palletizing of the parts at the maximum 999 positions is available for each axis.

### 8 Horizontal Axis/Traverse Axis Shift Palletizing

Setting of shift palletization for each horizontal axis and traverse axis.

### 9 Traverse Secondary Home Setting

In the case of a mold that has a motor placed on the top of the mold, for example, the traverse axis returns above the mold after waiting on the way while molding is proceeding.

### 10 Teaching Data Check Function

A function that a value more than the stroke cannot be entered.

### 11 Login Function

A function that only a registered person can log in and operate the system.
As standard, two stages of operation levels can be defined.

### 12 Undercut Release Servo Operation

For an undercut mold, a servo motor is used to release the undercut.

# Standard Specification Description

## 13 Initial Reject Quantity

A function that only the predefined number of the parts initially be rejected.

## 14 NG Parts Reject/Overflow Reject

A function that when an interlock from an auxiliary equipment is not released after NG signal is received from IMM, the parts is rejected.

## 15 Shutdown Circuit After Consecutive NG Rejects

A function that the system is shut down after the predefined number is reached, when NG parts continuously occurs and overflows.

## 16 Auxiliary Equipment Interlock Setting

Setting for interlocking with an auxiliary equipment such as inspection device and stock device.Including the supply of the molded parts by STANDBY OK signal of an auxiliary equipment or AUXILIARY EQUIPMENT START signal and etc.

## 17 Vertical Axis - Proximity to Mold Halt

A function that the vertical axis moves down up to the vicinity of the mold from the uppermost in order to wait for the mold to open before the mold opens.

## 18 Original Optimize Movement

A function to enable quick and smooth movement in a curve-like fashion.

## 19 Detailed Display of Operations History and Data Storage

A function that operations history is recorded and displayed, and these data can be saved in a USB memory.

## 20 Maintenance Period Setting, Alarm Indication

A function that maintenance period is specified and alarm is indicated.

## 21 Position Teaching While Auto Mode in Execution (Max. ± 3 mm)

Fine tuning of a position can be executed while the system operates in auto mode.

## 22 Energy Saving Operation

A function that the system operates at the speed automatically lowered in the range of the  cycle to reduce the load on a take-out robot.

## 23 Sampling Mode

A function for unloading the parts at a sampling position.

## 24 Production Control Mode

When the predetermined number is reached the buzzer, for example, sounds to shut down the operation.



# Descriptions of Standard and Optional Specifications

## Standard Specification Description

### 25 MyPro Function

Arbitrary positions (Position, Timer, Input/Output) can be added and edited in Step unit.In addition, the operation of parts arm and runner arm can be individually defined, and the created Steps can be repeated in a specified number of cycles.

### 26 Control Box Internal Temperature Monitoring

The temperature in the control box is monitored.

## Optional Specifications Description

＊1 to 14 are equipped with an operation program as standard.

### 1 AIII, AB and D Flip-Turn Units

Flip-turn unit can be selected according to the size, weight, and necessary movement of the chuck.

### 2 Parts Vacuum Circuit (1-4 Lines)

The vacuum circuit can be increased to the maximum of 4 lines.

### 3 Vacuum Break Circuit (1- 4 Lines)

In order to facilitate taking out the parts when releasing them, a vacuum break circuit can be also installed in accordance with a vacuum system.

### 4 Pivot Turn/Turn Position Setting

By installing a pivot-turn unit, the chuck can be pivot-turned in a vertical direction.(The direction of the rotation axis is in vertical)In addition, this function is provided to set the position where the vertical turn is executed.

### 5 Parts Runner Vacuum Circuit

A vacuum circuit for suctioning a runner into the parts chuck.

### 6 Parts Unload 4-Position (with Vertical Shift Function)

In one single shot, the parts can be individually placed at four different places.Vacuum lines according to the number of unloading parts are required.

### 7 Beam-End Gate Cut 4-Position Cycle

Beam-end gate cut operation can be individually executed at four different places in one single shot.
＊Beam-end gate cut unit is required.

### 8 Beam-End Gate Cut Direction Setting for All Axes

Cutting direction at the beam-end for all axes can be defined.

### 9 Gate Cut Unload Position in Chuck or Traverse On-The-Way Position

Cutting position can be defined by using the chuck with a pair of nippers installed in the chuck.

# Optional Specifications Description

## Optional Specifications Description

*1 to 14 are equipped with an operation program as standard.

### 10 Pitch Change in Chuck

The pitch of the parts can be changed by using a chuck that has a pitch change function installed.

### 11 Undercut Release Air Operation

For an undercut mold, air cylinder is used to execute undercut release operation.

### 12 Extension of Vertical, Horizontal, and Traverse Stroke

The stroke for each axis can be extended.
Note) The stroke for traverse axis is in increments of 200mm.

### 13 Blower Specification

This specification is provided to use blower chuck and blower motor so that small parts or complicated shape parts, or cylindrical parts incapable of holding by suction cups can be suctioned with a large volume of vacuum force.(Ex. Ball-point pen axis)

### 14 Energy Saving Vacuum Circuit

This specification is provided to use energy saving vacuum circuit so that compared to standard specifications, the amount of compressed air used can be reduced, and the power consumption also is significantly lowered.

### 15 Parts Vacuum Circuit Multiple Systems (More than 5 systems.The software is not for standard)

Parts vacuum circuit with more than 5 systems can be used.

### 16 Controller Stand

A stand to place the handy controller (touch panel).

### 17 Telescopic Specification

Two-tier structure makes it possible to keep the maximum height of the system low for the same upper and lower strokes.

### 18 Clean Room Specification

This specification is provided to use the controller in a clean room by installing a tray on the part where dust possibly occurs, or by covering the surface with stainless steel.

## For your safety(Domestic Law in japan)

This system corresponds to an “industrial robot”. To use it, participation in “Special Training on Operations of Industrial Robots” (*) legally prescribed is required.
In addition, risk assessment should be executed at the installation site, and safety measures such as installing fences should be taken.

*This training is also held in Ome Factory of Robotics Division in The Sailor Pen Co., Ltd.
For more information, please see the website of this division.
*Refer to the law in which country the machine is installed.



# Introduction for Other Special Specifications

## Two-Head Specification

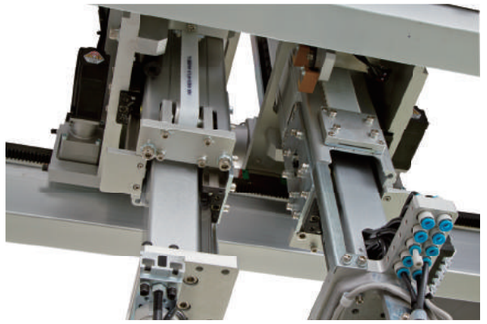
This specification is provided to respond a two-color molding machine by using a system with two heads for primary take-out and secondary take-out.

## Insert (In-Mold) Specification

This specification is provided to use a chuck with insert function for insert operation.
It is possible to insert a workpiece such as a metal or film in the mold, and also to take out the workpiece.

## Telescopic Specification

Two-tier structure makes it possible to keep the maximum height of the system low for the same upper and lower strokes.



## Blower Specification

This specification is provided to use blower chuck and blower motor so that small parts or complicated shape parts incapable of holding by suction cups can be suctioned with a large volume of vacuum force.


## Servo Chuck Turn

This specification is provided to use a servo motor for rotating a chuck.Teaching by means of the touch panel makes it possible to operate the chuck at any angle.

## Stack Specification

This specification is provided to install a parts chuck on the two arms one by one for parts take-out operation.

## T-Shaped Specification

This specification is such that the arm extends on both the molding machine operation side and the non-operation side.
For example, it is possible to place a part on the operation side and to drop a runner on the non-operation side.