

# ROBOT SOLUTION

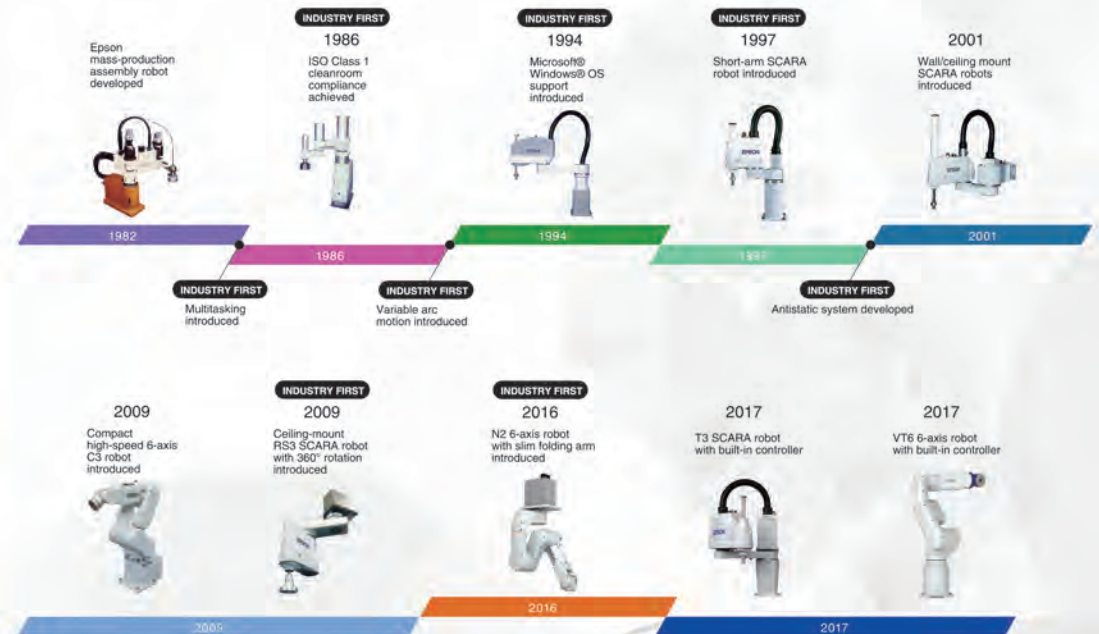


## ROBOT SOLUTION

# Epson Robot

**A proven reputation for precision and reliability at the leading edge of industrial robot design**

Ever since we developed our first SCARA robots for wristwatch assembly over 40 years ago, Epson has been a leader in advanced robotics technology. Today, our long experience in energy-efficient, compact, high-precision technologies enables us to offer a wide range of slim, compact, and lightweight robots. And with the addition of original Epson force sensing and image processing technologies, we are achieving even higher levels of reliability, speed, precision, and productivity in process automation. Whatever challenges you face, Epson industrial robots are continuously evolving to meet the diversifying needs of manufacturers worldwide.





# Why Epson Robots?



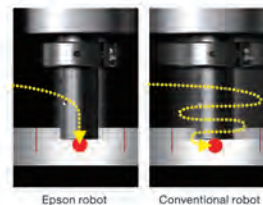
Epson, the global leader in robotics technology, offers you an impressive combination of high performance and operating ease. Backed by a worldwide reputation for reliability and outstanding customer support, Epson robots are bringing high-productivity automated manufacturing to an ever-expanding range of industries worldwide.



## Low TCO and high reliability for the ultimate in automated productivity

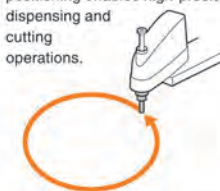
### High productivity

- Proprietary Epson technology reduces residual vibration to ensure high speed and precision for reduced takt time.
- Slim, lightweight body design reduces work cell space requirements while enabling higher productivity.



### High quality

- Extremely accurate toolhead positioning enables high-precision dispensing and cutting operations.



- Integrated machine vision systems boost setup ease and workpiece handling accuracy.



### Easy operation

- Intuitive graphical interface makes programming easy even for first-time users.
- From program testing to full production, improved operating ease helps reduce cost and manpower requirements.



3D simulator for work cell layout and toolpath program testing

### Software Integration



### Global support

Epson supports robotics customers worldwide through an international network of sales and service offices, providing information about equipment configuration options and performing simulations of the tasks that customers want robots to perform. We are also partnered with systems integrators around the world, and can provide end-to-end turnkey solutions to meet virtually any process automation need.



# ROBOT SOLUTION

## Product lineup

SCARA robots							
Epson Robot	G Series						
	Top-class speed, repeatability, and low residual vibration						
Publication page	▶P.9	▶P.11	▶P.15	▶P.17	▶P.21	▶P.23	▶P.23
Model name	G1	G3	<b>NEW</b> GX4	G6	<b>NEW</b> GX8	G10	G20
Payload (kg)	4-axis 3-axis 1 1.5	Max 3	Max 4	Max 6	Max 8	Max 10	Max 20
Arm length (mm)	175 225	250 300 350	250 300 350	450 550 650	450 550 650	650 850	850 1000
Environmental specifications	STD Class 3	STD Class 3	STD Class 3	STD Class 3 IP54 IP65	STD Class 3 IP65	STD Class 3 IP54 IP65	STD Class 3 IP54 IP65
Installation specifications	Table Top mount	Table Top mount Wall mount	Table Top mount Wall mount	Table Top mount Wall mount Ceiling mount	Table Top mount Wall mount Ceiling mount	Table Top mount Wall mount Ceiling mount	Table Top mount Wall mount Ceiling mount
Compatible controller	RC700-A	RC700-A	RC700-D	RC700-A	RC700-D	RC700-A	RC700-A

# ROBOT SOLUTION

SCARA robots								
LS Series				T Series		RS Series		
Proven reliability and functionality				Built-in controller for cost-efficient automation		Original space-saving design for high productivity		
Publication page	▶P.27	▶P.29	▶P.31	▶P.33	▶P.35	▶P.37	▶P.39	▶P.41
Model name	LS3-B	LS6-B	LS10-B	LS20-B	<b>NEW</b> T3-B	<b>NEW</b> T6-B	RS3	RS4
Payload (kg)	Max 3	Max 6	Max 10	Max 20	Max 3	Max 6	Max 3	Max 4
Arm length (mm)	400	500 600 700	600 700 800	800 1000	400	600	350	550
Environmental specifications	STD Class 3	STD Class 3	STD Class 3	STD Class 3	STD Class 3	STD Class 3	STD Class 3	STD Class 3
Installation specifications	Table Top mount	Table Top mount	Table Top mount	Table Top mount	Table Top mount	Table Top mount	Table Top mount	Table Top mount
Compatible controller	RC90-B	RC90-B	RC90-B	RC90-B	Built-in controller	Built-in controller	RC700-A	RC700-A

- Standard
- Cleanroom model ISO 03 (Class 10 equiv.) ESD suppression
- Cleanroom model ISO 04 (Class 100 equiv.)
- Cleanroom model ISO 05 (Class 100 equiv.)
- Protection model IP54
- Protection model IP65
- Protection model IP67
- Table Top mount
- Wall mount
- Ceiling mount
- Wall/ceiling multi-layout mount

- \*1: See product page for details  
\*2: IP20 \*3: Standard model only
- Controllers**
  - Controllers ▶P.59
  - Software**
  - Software ▶P.62
  - Vision systems**
  - Vision systems ▶P.67
  - Force-sensing systems**
  - Force-sensing systems ▶P.70
  - Options**
  - Software options ▶P.74
  - Robot controller options ▶P.76
  - Manipulator options ▶P.79
  - Option quick-reference table ▶P.80
  - Option setup example ▶P.81



## Product lineup

Epson Robot	6-axis robots		
	C Series		
	Slim, lightweight body for greater installation flexibility		
Publication page	▶ P.43	▶ P.45	▶ P.49
Model name	C4	C8	C12
Payload (kg)	Max 4	Max 8	Max 12
Arm length (mm)	600 900	700 900 1400	1400
Environmental specifications	STD Class 3	STD Class 3 Class 4 Class 5 IP67	STD Class 3
Installation specifications	Table Top mount Wall mount	Table Top mount Wall mount Ceiling mount Wall/ceiling multi-layout mount	Table Top mount
Compatible controller	RC700-A	RC700-A	RC700-A

6-axis robots			
N Series			VT
Original compact design for greater freedom of movement in tight quarters			Compact, easy setup, low TCO
▶ P.51	▶ P.53	▶ P.55	▶ P.57
N2	N6-A850	N6-A1000	VT6L
Max 2.5	Max 6	Max 6	Max 6
450	850	1000	900
STD	STD Class 3	STD Class 3	STD Class 3 IP67
Table Top mount Wall mount	Table Top mount	Table Top mount	Table Top mount Wall mount Ceiling mount Wall/ceiling multi-layout mount
RC700-A	RC700-A	RC700-A	Built-in controller

- STD Standard
- Class 3 Cleanroom model ISO 03 (Class 10 equiv.) ESD suppression
- Class 4 Cleanroom model ISO 04 (Class 100 equiv.)
- Class 5 Cleanroom model ISO 05 (Class 100 equiv.)
- IP54 Protection model IP54
- IP65 Protection model IP65
- IP67 Protection model IP67
- Table Top mount
- Wall mount
- Ceiling mount
- Wall/ceiling multi-layout mount

\*1: See product page for details  
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## Vision systems

### 02 Vision Guide

Get advanced machine vision and image processing systems up and running fast with easy-to-use Epson Vision Guide software

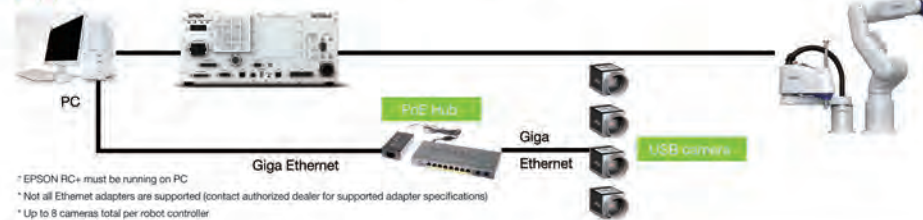
- Built-in image processing engine assists vision-to-robot calibration, making it easy to align the robot's coordinate system with the camera's field of view.
- Workpiece position can be determined relative to robot coordinates without complex calculations.
- Image processing sequences can be created simply by entering a few parameters and pointing and clicking with a mouse.
- Advanced pattern matching and geometric search tools enable easy solution program development without writing a single line of code.

#### System configuration examples

##### CV-2A(HA, SA), L



##### PV1



#### Features

##### Convenience

EPSON RC+ software can be used for both robot and machine vision program development.

- Other machine vision systems are more complicated to set up because different software must be used for machine vision and robot program development.

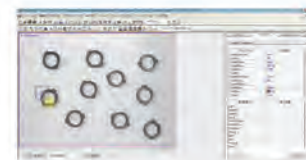
##### Ease of use

Easy registration of vision objects (positioning coordinates, etc.) enables rapid system setup and deployment.

- Vision objects can be registered via simple drag & drop operation.
- Intuitive interface makes operation easy even for first-time users.

##### ● Robot & Vision Programming

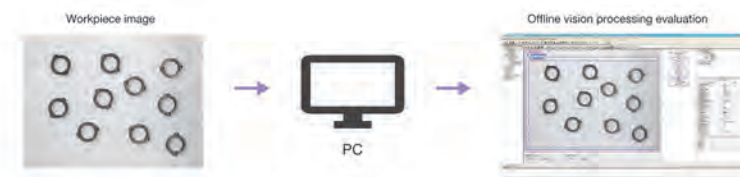
- Vision & Guide Window
- Simulator
- Jog & Teach Window



### Vision simulation

Epson Vision software includes a simulator that lets you visualize robot operation and workflow before equipment is actually installed. This makes it easy to plan and configure the system for maximum productivity, and allow program development to proceed while the system is being constructed.

- Vision and process sequencing can be prepared in advance, before system is installed.
- Programs that include image processing sequences can be tested off line.
- If workpiece images are available, image processing can be tested off line.



### Easy calibration

A built-in image processing engine makes it easy to align the camera's field of view with the robot's coordinate system, eliminating the need for complex programming when performing vision-to-robot calibration.

The robot automatically\*1 follows the steps in the Calibration Wizard to complete the calibration.\*2



### One-stop service

Whether you need help with initial setup or active production lines, Epson gives you one-stop service convenience for both robot and machine vision systems. With only one service call instead of two to coordinate, your production line will be back up and running in no time.



## Force-sensing systems

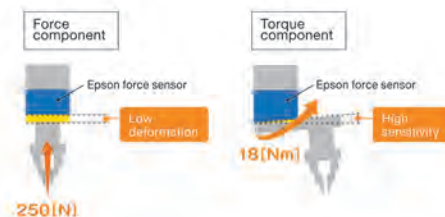
High-rigidity, high-sensitivity S250 Series force sensors are specifically designed for use with Epson robots, enabling extremely precise force control for high-precision assembly tasks.

### 03 Force sensors

S250 Series force sensors incorporate exclusive Epson crystal piezoelectric technology that ensures a higher level of rigidity and sensitivity than conventional force sensors.

#### Advantage 1 high rigidity

S250 Series sensors are extremely rigid and resistant to deformation under heavy loads. They have a rated load of 250[N] on the X, Y, and Z axes, and a moment of force of 18[Nm] that makes them particularly sensitive to axial stress.

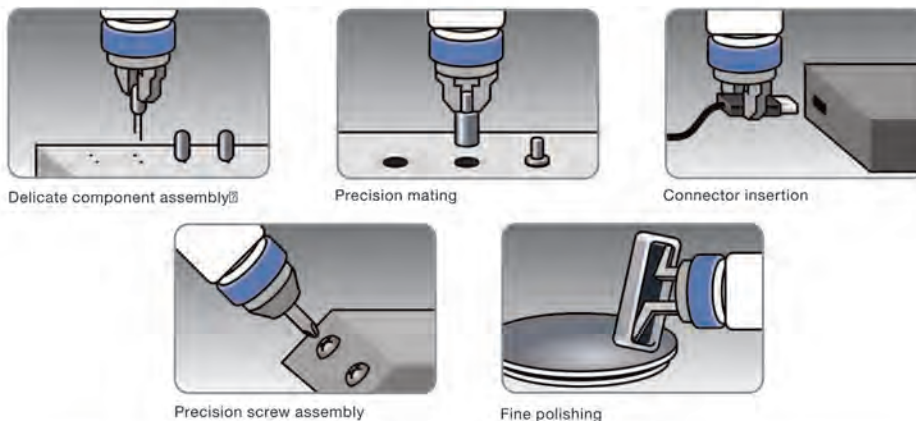


#### Advantage 2 high sensitivity

S250 Series sensors also ensure excellent sensitivity and quick response with high resolution of 0.1[N] and a low noise level of 0.035[N] on the X, Y, and Z axes.

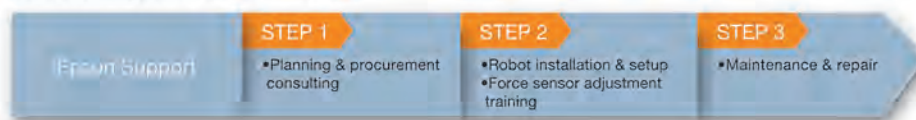
### Force-sensing system applications

Robots equipped with an Epson S250 Series force sensing system can handle high-precision tasks that cannot be safely automated with teaching or machine vision systems alone. As a result, even production processes that previously required experienced workers to handle delicate and easily damaged workpieces can be fully automated.



### One-stop Epson support

From initial planning and procurement, to setup, adjustment, ongoing maintenance and re-pair, Epson provides one-stop support for all your force-sensing system and automation needs.



High-rigidity, high-sensitivity S250 Series force sensors are specifically designed for use with Epson robots, enabling extremely precise force control for high-precision assembly tasks.

### Easy force sensing program development

The new Force Guide interface makes it easy to develop force sensor operating programs simply by dragging Force Guide object icons into a flow chart. In addition, simulator motion display and force waveform monitoring make debugging easier than ever before.



#### Force Guide GUI

The Force Guide interface provides a clear explanation of what each programming object does, as well as a flow chart view for easy confirmation of program sequence ordering.



#### Simulator

The simulator enables quick confirmation of the direction of robot arm movement and axis coordinates.



#### Force waveform display & recording

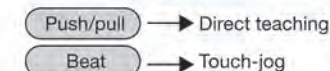
The force waveform display allows realtime waveforms to be compared with previously recorded waveforms, enabling users to identify operating anomalies and understand how various conditions affect performance.

### Direct teaching function

6-axis robots equipped with force sensors can be taught using the Epson TP2/TP3 teaching pendant. Operators can manually move the robot arm and manipulator to the desired position and use the teaching pendant to confirm hardness/softness of the workpiece and the force to be applied.\*

### Touch-jog function\*

In addition to the standard button-operated jog and teaching modes, the TP2 teaching pendant now has a direct teaching mode with a touch-jog function that makes 6-axis robot teaching much easier. During direct teaching operations, you can simply tap the effector to make small, incremental adjustments to the effector's position. There's no need to manually switch input modes because the system can automatically recognize the amount of force being applied to the effector.



\* Supported by TP2 teaching pendant and C4, C8, N2, and N6 robots (controller firmware v7.4.6 or newer required)

### Product photos

#### 03 S250 Series force sensor



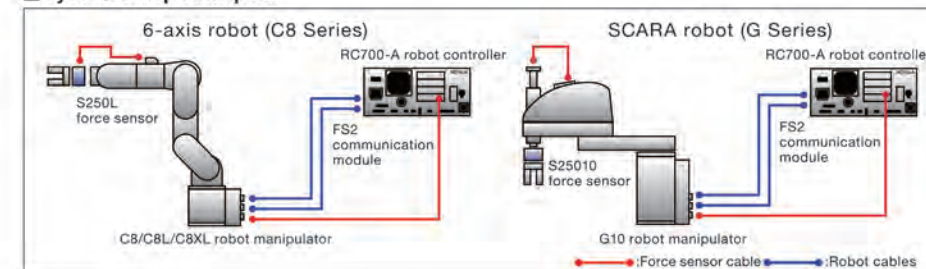
#### 03 FS2 communication module



#### FS2 system requirements

Supported controller	RC700-A One FS2 module per controller (inserted in option slot)
No. of supported force sensors	One sensor per module
Power supply	Via option slot

### System setup examples





## Robot controller options

A wide range of controller options are offered to expand the range of tasks and processes that can be automated.

### 04 Teaching Pendant (TP3)

Compatible controllers  
RC700-A T series VT series

Tablet-type teaching pendant with 10.1-inch color touchscreen for intuitive operation and fast, easy 6-axis robot teaching

#### Easy-to-view screen

- 10.1-inch TFT LCD (w/ LED backlight)
- 1280 x 800 resolution
- Color display



#### Easy operation

- Simple screen layout, fast response
- Standard RC+ program interface

#### Advanced features

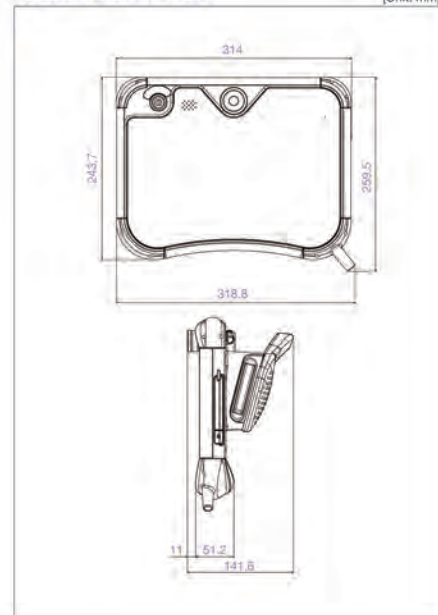
- 3D robot graphics, programming functions and parameter settings
- High-speed test mode
- Programs can be started/stopped from operating panel

#### Main specifications

Dimensions (mm)	314(W) x 244(H) x 142(D)
Weight	1.5kg (excluding cable)
Body color	Black
Connectivity	Wired
Display	10.1-inch TFT LCD (w/ LED backlight) Resolution: 1280 x 800
Controls	Touchscreen controls Emergency stop button Enable switch Mode switch Control keys (JOG, EXE buttons) USB port
Cable length	3m (10m, 15m extension cables available)
Interface languages	English, Japanese, German, French, Chinese (simplified, traditional)
Ingress protection	IP65
Operating temperature range	0–40°C (stable temperature)
Operating humidity range	5–95% (relative humidity)
Operating environment	Low levels of dust, oil mist, salt, iron particles and other contaminants No flammable or caustic liquids or gases nearby

#### External dimensions

[Unit: mm]



### 04 Teaching Pendant (TP2)

Compatible controllers  
RC700-A RC90-B T series VT series

Easy-to-use pendant for teaching

- Universal design ensures ease of use for both right-handed and left-handed operators.
- Connects directly to operator unit or controller interface card.



### 05 Conveyor tracking

Compatible controllers  
RC700-A RC90-B T series VT series

Precision tracking for high-productivity pick-and-place operation

- Enables pick-and-place handling of items on a high-speed conveyor.
- Uses machine vision/sensors to detect workpiece and effect robot handling.
- Can automate manual kitting/packaging tasks and help maintain productivity regardless of continuous/intermittent conveyor operation. Can also be used for workpiece assembly.
- Simple start/stop program execution.

\*Vision Guide software required.



### 05 PG motion system

Compatible controllers  
RC700-A RC90-B T series VT series

Control peripheral robots for fully integrated process automation

- EPSON RC+ software and pulse generator (PG) cards enable control of multiple third-party drives and motors.
- PG robots and standard EPSON RC+ system robots can be operated simultaneously, and controlled using the same commands.
- PG cards can be used to control X/Y tables, sliders, turrets,

and a wide range of other production/inspection line peripherals.  
■ Each PG card has 4 channels, and can support from 1 to 4 robots. Up to 4 cards can be mounted.

\*PG motion system requires optional EPSON RC+ software and at least one optional PG output board. Drivers and motors for third-party devices are not included.



## Robot controller options

## Manipulator options

Epson robot manipulator options provide the enhanced functionality and configuration flexibility you need for full-process automation.

### 06 Emergency stop switch

Compatible controllers  
RC100-A RC90-B T series VT series

Helps prevent injuries and damage

- Immediately stops robot operation in emergency situations.



### 07 RS-232C cards

Compatible controllers  
RC100-A RC90-B

Expanded serial port connectivity

- 2-port RS-232C cards to connect serial interface devices.



### 08 I/O expansion cards

Compatible controllers  
RC100-A RC90-B

Expanded input/output flexibility

- 24-input/16-output expansion cards.



### 09 Fieldbus I/O (slave)

Compatible controllers  
RC100-A RC90-B T series VT series

High-speed peripheral connectivity

- 2048-point I/O support for DeviceNet™, Ethernet/IP™, PROFIBUS®, and PROFINET® networked peripherals, and 384-point I/O support for CC-Link® networked peripherals.

### 10 Fieldbus I/O (master)

Compatible controllers  
RC100-A RC90-B T series VT series

Bidirectional high-speed peripheral connectivity

- Support for DeviceNet™, PROFIBUS®, and Ethernet/IP™ networked peripherals (1024-point I/O).

### 11 Analog I/O card

Compatible controllers  
RC100-A RC90-B

For analog control of voltage and current I/O

- Analog control of input and output current and voltage allows regulation of secondary equipment such as paint sprayers to match the speed of robot arm motion. Available in 1 channel and 4 channel models.



### 12 EUROMAP 67 card

Compatible controllers  
RC100-A RC90-B

For use with thermoplastic injection molding machines

- EUROMAP 67 compliant electrical interface with 15-point input and 16-point output.



### 13 I/O cable kit

Compatible controllers  
RC100-A RC90-B

Cables and connectors for easy connectivity with no soldering required

- A wide range of I/O cables and connectors are available.



### 14 Hot plug kit

Compatible controllers  
RC100-A T series VT series

Easy Teach Pendant connection/disconnection

- Allows Teach Pendant to be connected or disconnected without an emergency stop.

\*Conversion cable required for use with TP1 or TP2.



### 15 Wall mount option

Compatible controllers  
RC100-A

Optional wall mounting box

- Allows controller to be mounted on a wall.



### 16 External wiring units

Compatible manipulators  
G6 G10 G20 V16

Simplifies wiring when mounting manipulator options

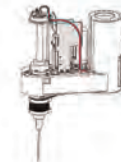
- Enables easy, on-site connection of external wiring by users.
- Ideal for connecting Vision Guide system camera cables or other wiring.



### 17 Internal wiring unit

Compatible manipulators  
R03 R04

Enables wiring and conduits for the hand to be enclosed within the robot arm assembly.



### 18 SCARA tool adapters

Compatible manipulators  
G1 G6 G10 G20 L03 L06 L10 L15 L20 T2 T4 R03 R04

Enhances handling/processing versatility and simplifies effector changes



### 19 ISO flanges

Compatible manipulators  
V16

For easy attachment of effectors to 6-axis robot arms

### 20 Brake release units

Compatible manipulators  
C4 C6 R2 R6

Enables brake release so robot arm can be moved by hand when power is switched off at the leading edge of industrial robot design

### 21 Power and signal cables

Compatible manipulators  
G1 G2 G4 G10 G20 L03 L06 L10 L15 L20 R03 R04 C4 C6 R2 R6

Standard 3m cables, or optional 5m and 10m cables for greater freedom in controller and robot placement

### 22 Power cable connectors

Compatible manipulators  
G1 G2 G4 G10 G20 R03 R04 C4 C6 R2 R6

Power cables are available with straight or L-shaped angle connectors\*



### 23 Camera mounting bracket

Compatible manipulators  
G6 G10 G20 L03 L06 L10 L15 L20 T2 T4 V16 R03 R04 C4 C6 R2 R6

Securely mount machine vision system camera to robot arm



Bracket design varies according to robot; please specify model when ordering.



## Option quick-reference table

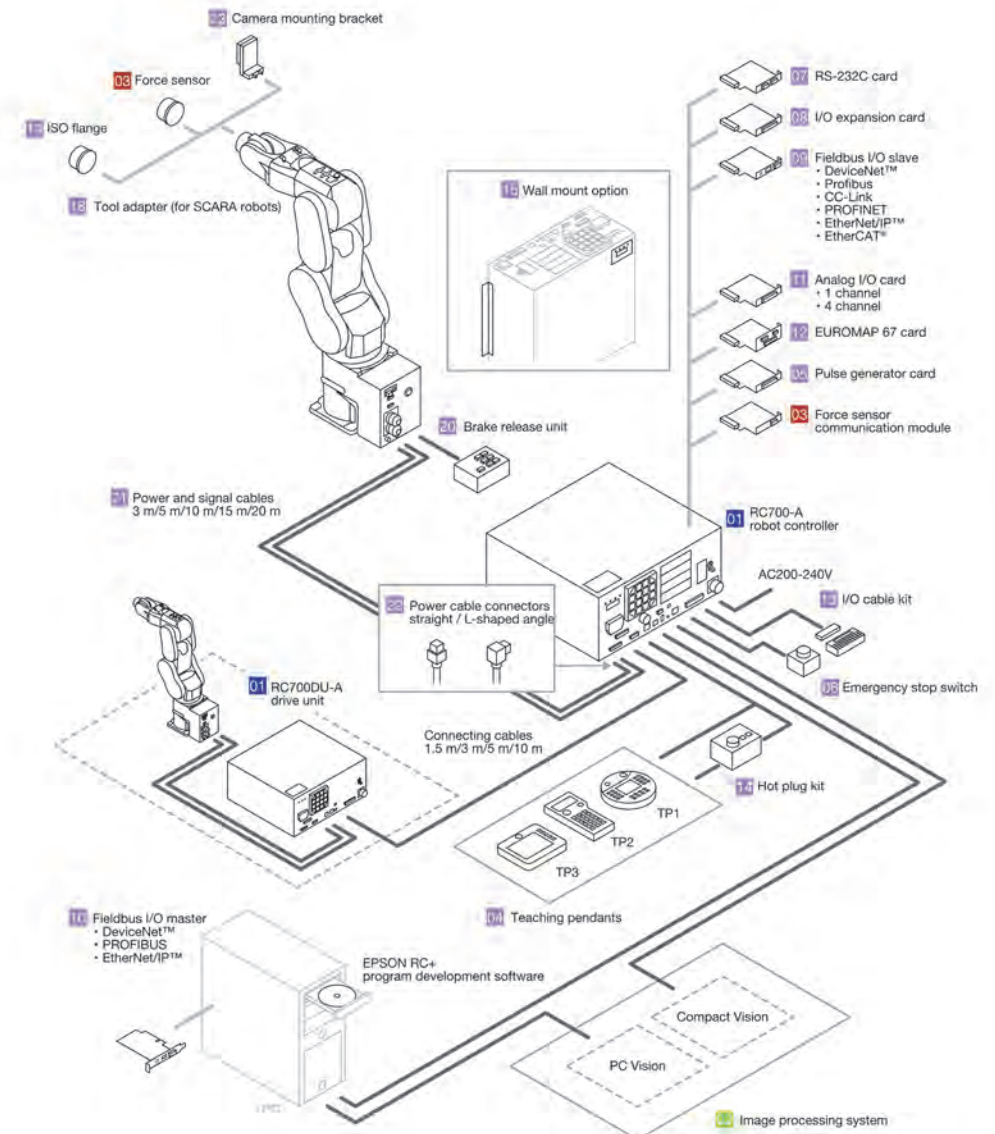
## Option setup example

Software options					
	RC700-A	RC700-D	RC90-B	T series	VT
02 Vision Guide 7.0	●	●	●	●	●
03 Force Guide 7.0	●	●	—	—	—
RC+ API 7.0	●	●	●	●	●
ECP	●	●	●	●	●
GUI Builder 7.0	●	●	●	●	●
OCR	●	●	●	●	●
VRT	●	●	●	●	●

Controller options					
	RC700-A	RC700-D	RC90-B	T series	VT
04 Teaching Pendant (TP2)	●	●	●	●	●
04 Teaching Pendant (TP3)	●	●	—	●	●
05 Conveyor tracking	●	●	●	—	—
05 PG motion system	●	●	●	—	—
06 Emergency stop switch	●	●	●	●	●
07 RS-232C cards	●	●	●	—	—
08 I/O expansion cards	●	●	●	—	—
09 Fieldbus I/O (Slave)	●	●	●	●	●
10 Fieldbus I/O (Master)	●	●	●	●	●
11 Analog I/O card	●	●	●	—	—
12 EUROMAP 67 card	●	●	●	—	—
13 I/O cable kit	●	●	●	—	—
14 Hot plug kit	●	●	—	●	●
15 Wall mount option	●	●	—	—	—

Manipulator options															
	G1	G3	G4	G6	G8	G10/G20	LS3/LS6/LS10/LS20	T3-B/T6-B	RS3/RS4	C4	C8	N2	N6	VT6	
16 External wiring units	—	—	—	●	●	●	—	—	—	—	—	—	—	●	
17 Internal wiring unit	—	—	—	—	—	—	—	—	●	—	—	—	—	—	
18 Tool adapters/ISO flanges	—	●	●	●	●	●	●	●	●	—	●	●	●	●	
20 Brake release units	—	—	—	—	—	—	—	—	—	●	●	●	●	—	
21 Power and signal cables	●	●	●	●	●	●	●	—	—	●	●	●	●	—	
Cable length (m)	3.5,10,15,20						3.5,10	(built-in controller)	3.5,10,15,20						(built-in controller)
Cable type (Standard/High-flex)	Standard						Standard	(built-in controller)	Standard	Standard/High-flex	Standard	Standard/High-flex	(built-in controller)		
22 Power cable connectors (Straight/L-type)	Straight/L-type			Standard			Standard	Straight/L-type						(built-in controller)	
23 Camera mounting bracket	—	●	●	●	●	●	●	●	●	●	●	●	●	●	
RC700DU-A (Drive unit)	●	●	—	●	—	●	—	—	●	●	●	—	●	—	

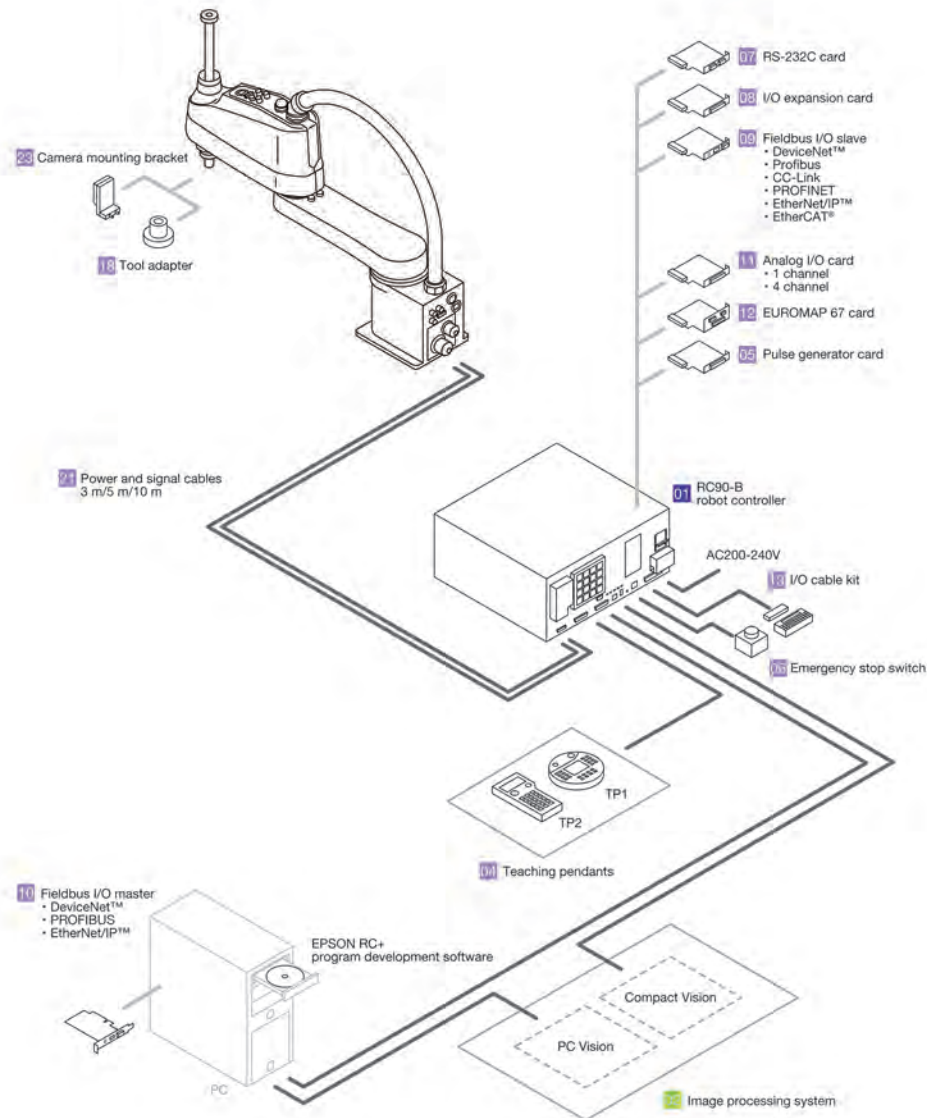
## RC700-A controller with C series robots



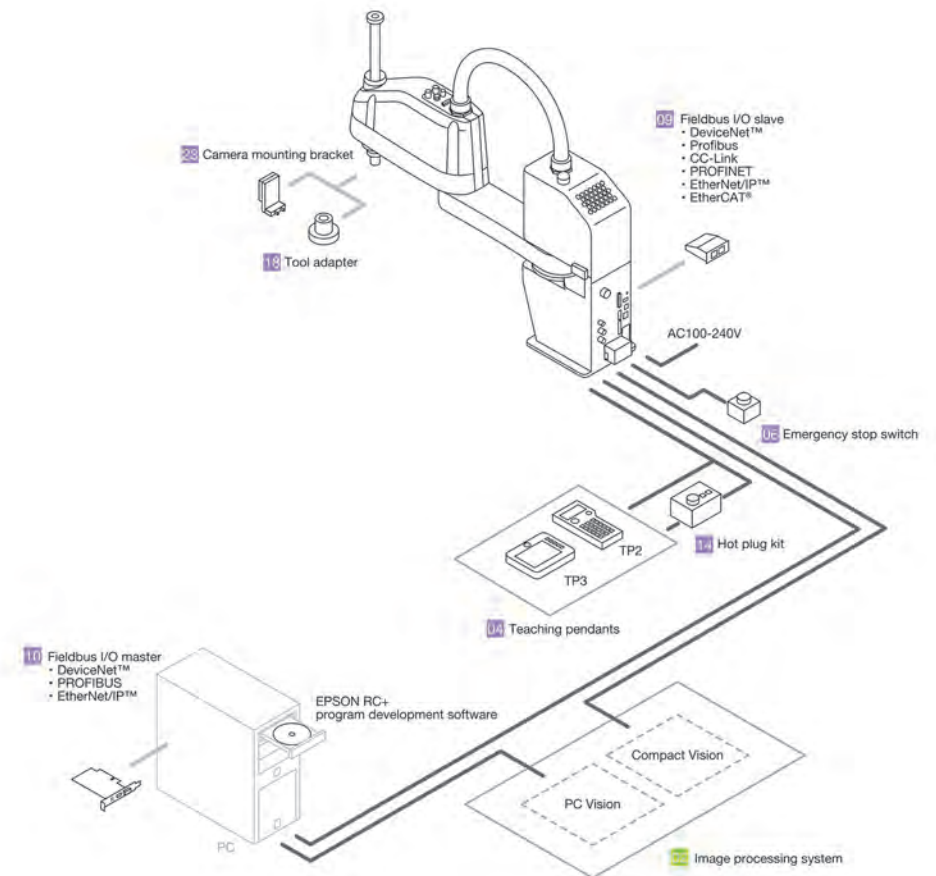


## Option setup example

### RC90-B controller



### T series robot

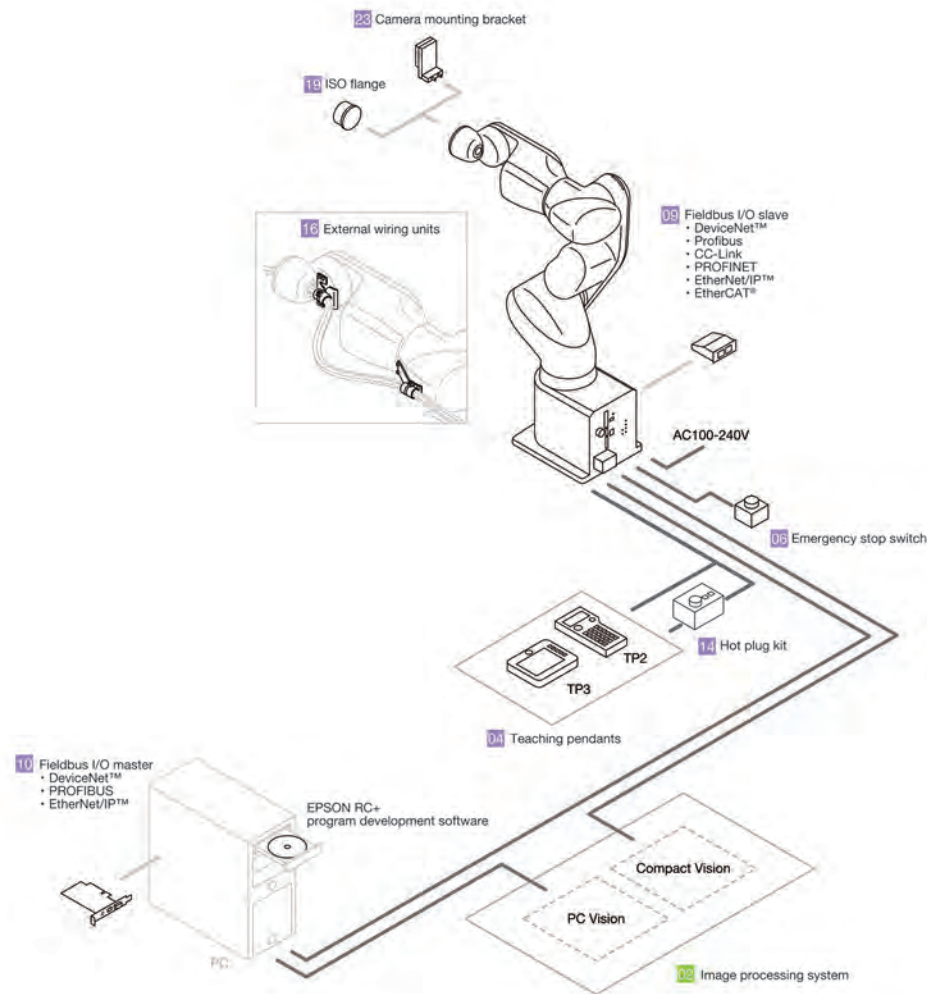




# ROBOT SOLUTION

Option setup example

VT series robot



# BRINGING AUTOMATION TO THE NEXT LEVEL.



Epson Robots are built for greater efficiency and precision while fusing form and function. Equipped with an optional complementary force sensor that is both sensitive and versatile, the robots are capable of executing a wide range of high precision tasks. Details make all the difference in the world of automation. Experience lower production costs, enhanced quality and increased productivity with Epson's highly reliable robots, while increasing businesses' bottom line.



## IT'S IN THE DETAILS.

A global leader in precision robotics, Epson robots redefine reliability, accuracy and speed

# EPSON