
EPSON SCARA G-SERIES

OUR SCARAS GET TO THE POINT FASTER



FOR RELIABLE HANDLING

EPSON[®]
EXCEED YOUR VISION

ABOUT EPSON

EPSON SCARA G-SERIES

About Epson	2
Introduction and overview — product portfolio	4
The advantages of SCARA robots	6
Name syntax and table — G-series	7
Epson SCARA G1 and G3	8
Epson SCARA G6, G10 and G20	9
Typical applications	10
Epson RC+ Simulator	11
Design of Epson SCARA robots	12
Connections	13
Epson Smart Motion	14
Controller and Machine Vision	15
Technical data — Epson G1	16
Technical data — Epson G3	18
Technical data — Epson G6	20
Technical data — Epson G10	22
Technical data — Epson G20	24
Resource conservation	26
Environmental performance	27

Epson, a subsidiary of Seiko Corporation, launched the first robots in the 1980ies. Those were used for precise and fast assembly of Seiko watches. Soon Epson industrial robots and controllers started to conquer markets all over the world. Today, Epson Factory Automation is one of the leading companies producing high-quality robot systems with branches on all five continents.

- In-house Research and Development department for automation processes
- 1982 first freely available Epson SCARA robot in Japan
- 1986 world's first class 1 clean-room robot
- One of the world's most comprehensive SCARA model ranges
- 1997 first PC-based controller
- 2008 inventor of the G3 with righty or lefty arm orientation
- 2009 inventor of the SPIDER: a unique SCARA robot with 450° work envelope

EPSON ROBOT SYSTEMS — TO SPEED UP YOUR PRODUCTION RUN

Our robots palletise, saw, mill, drill, grind, mount, move and assemble. They work precisely and at breathtaking speed in these and many other applications — often up to 24 hours a day.

As one of the pioneers in robotics we know exactly what the main feature of the combination of kinematics and intelligent control must be apart from speed and precision: Reliability! That is because the standstill of an installation resulting in a loss of production is expensive, very expensive. Therefore to us, innovation means more than just up-to-date robot technology. Every day, our development engineers strive to make our robot systems even more economical, flexible and reliable — under all conditions.

Integrated automation

We offer you a flexibly expandable range of products with different integrated components. Among these are a great number of SCARA robots and 6-axis robots for diverse applications as well as controllers and software. Everything engages perfectly and is easy to operate.

SERVICE AND SUPPORT

Our service and support program helps you to tap the full potential of your Epson robot systems.

Feasibility studies

Instead of theoretical simulations we offer cycle time tests with real robots. There are many ways in which you benefit from those studies. Prior to your investment you are provided with optimal robot configuration and installation site as well as precise cycle times. That is how you get maximum planning and project security.

Pre-sales support

How can a robot system be efficiently integrated into an installation? How can cycle times be optimised? How can the robot program be integrated into external software? Our application engineers advise you during planning as well as during implementation.

Training

Whether you need introductory seminars, or programming, maintenance or operator trainings — our experts share their knowledge with you and your employees.

After-sales support

Hotline service, repair service on site, inspection and individual maintenance concepts as well as spare part packages tailored to your needs are only some examples of how we do everything to have your production running non-stop.

Central spare part stocking

All spare parts are rapidly delivered from our central warehouse in Meerbusch, Germany.



WE ARE SCARA!

SCARA (Selective Compliance Assembly Robot Arm) robots, also referred to as “horizontal articulated arm robots”, are a success story of automation. With four degrees of freedom, they can freely position and join a payload with every possible horizontal orientation. They are relatively easy to set up and work particularly precisely and reliably.

In the beginning was Epson

In a study, Professor Hiroshi Makino from Yamanashi University in Tokyo found that the majority of joining processes in production are vertical processes executed from above — that was when the SCARA was born! The Seiko Epson company immediately took on that method and developed a robot type for in-house production. That was even before that kinematics was brought on the market as the first freely available SCARA in 1982.

The SCARA principle: simply reliable

The design of SCARA robots is similar to a human arm, since they have an articulated arm which can only swing horizontally. Usually, they have four freely programmable axes allowing handling in plane-parallel surfaces. The shaft serves to install tools and can rotate independently from its vertical motion to freely orientate the product within the work envelope. Thanks to their design, SCARAs feature high vertical rigidity.

Adapt your installation to the robot? Why not just choose the Epson robot you need?

Different arm lengths / payloads



Different protection classes



Mounting options



Different arm lengths / payloads



Different shaft lengths



Experience, expertise, inventiveness or, put more simply: the specialists

Ever since we started, we have been continuously further developing the SCARA technology and have realised milestones such as ball screw splines, brushless motors with absolute encoder, Smart Motion Control and much more. Today, Epson has the most comprehensive SCARA robot product range worldwide — offering more than 200 variants.

Good — better — Epson

With Epson you can be sure. We develop SCARA robots in our in-house research centres and produce them in our quality-certified manufacturing facilities. The result: SCARAs that work with perfect precision and reliability, convince through short cycle times and are incredibly user-friendly.

COMPACT, FAST, PRECISE — AND EXTREMELY VERSATILE

There are more than 300 SCARA variants, arm lengths ranging from 175 mm to 1,000 mm, payloads ranging from 1 kg to 20 kg and different mounting options. The robots are available in different protection classes or as cleanroom versions — we are absolutely certain that we can offer you just the right SCARA robot for your application.

Robust design

The reduced number of assemblies as well as the integrated feed-through allow reliable operation without expensive maintenance work.

Small interference contours reduce the risk of collision, which is particularly important if there are several robots working together in most confined spaces. High arm rigidities make the Epson SCARA insensitive to high insertion forces.

Your advantages with Epson SCARA robots

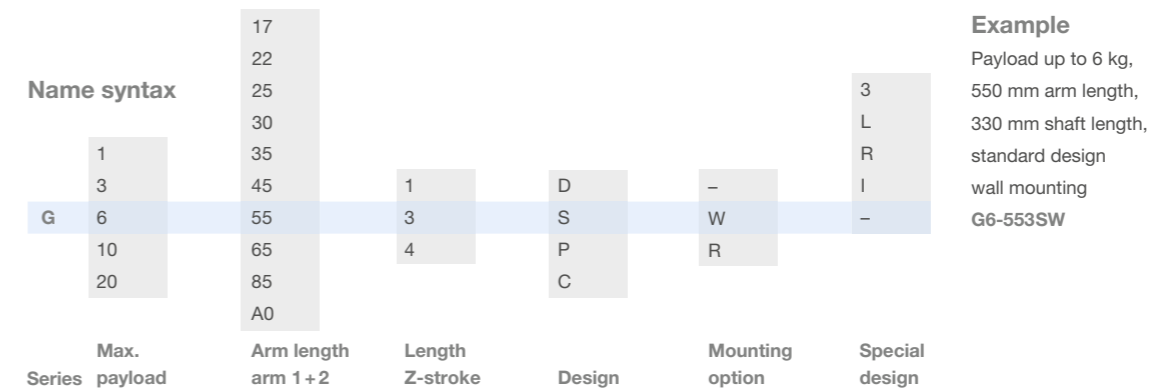
- Fast thanks to Smart Motion technology
- Optimal repeatability and accuracy
- Outstanding joining properties
- Self-supporting design allows direct teaching
- High availability
- Particularly low-maintenance
- High point accuracy
- Low vibration
- High insertion forces due to high arm rigidity
- Space-saving thanks to compact design
- Different payloads and reaches for different applications
- Low deadload — easy integration and high dynamics



G6-551S

How to decode the G-series names

There is a lot of information already in the designations of the G-series. We give you an example to show you how to “read” the names: G6-553 SW.



Configuration of the Epson SCARA G-series

	G1	G3	G6	G10	G20
Payload (nom./max.)	0.5/1.5 kg	1/3 kg	3/6 kg	5/10 kg	10/20 kg
Reach (arm 1 + arm 2)	(mm) 175				
	(mm) 225				
Z-stroke (with bellows)		(mm) 250			
		(mm) 300			
		(mm) 350			
			(mm) 450		
			(mm) 550		
Mounting option			(mm) 650	(mm) 650	
				(mm) 850	(mm) 850
					(mm) 1,000
multi-mount = MM	-	floor	floor	floor	floor
	W		MM (not G3-251x)	wall	wall
	R		MM (not G3-251x)	ceiling	ceiling
Design	S	IP20	IP20	IP20	IP20
	D			IP54	IP54
	P			IP65	IP65
	C	ISO3 / ESD	ISO3 / ESD	ISO3 / ESD	ISO3 / ESD
special design		3 (3-axis)	L / R (lefty/ righty arm optimised)	I (inverted)	I (inverted)

Multi-mount: One robot can be used for different mounting options without modifying the kinematics.

G FOR GENIUS — THE EPSON G-SERIES

Epson SCARA G1 Our mini — compact power

The solution for tasks in most confined spaces: the Epson G1 — developed as a micromanipulator, transfer unit or high-performance feeder for larger robots. Designed for work where a thousandth of a millimetre matters, such as for electronic manufacturing or precision-mechanical work processes. Ultralight due to its high-strength aluminium design and at the same time compact and powerful.



Epson G1

Max. payload
4-axis robot: 1 kg
3-axis robot: 1.5 kg
Reach: 175/225 mm
Z-stroke: 100 mm

Epson SCARA G3 It's all about the curve

SCARA G3 are just the right choice for use in confined spaces as they are common in automated component manufacture, since these robots, despite their compact size, cover a large work envelope.

However, we did not stop there and have further developed the G3 based on the fact that a high percentage of all assembly work is performed in the same arm orientation. Therefore, Epson G3 are also available with a left-curved or right-curved first arm. Thanks to this arm geometry especially developed by Epson, the Epson G3-351-L/G3-351-R is the only SCARA of that size on the market whose maximum rectangular work envelope covers an area larger than an ISO A4 sheet.

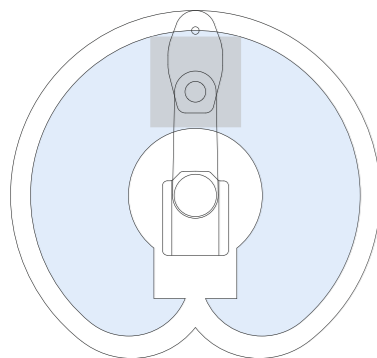


Epson G3

Max. payload: 3 kg
Reach: 250/
300/350 mm
Z-stroke: 150 mm

37,600 mm²

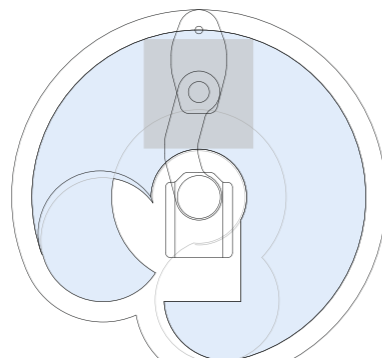
Max. square work envelope



Work envelope for a standard arm

52,900 mm²

Max. square work envelope



Work envelope for a lefty optimised arm

Maximum work envelope at minimum space requirement

A comparison of the G3-351S with the lefty arm optimised G3-351-L shows that the maximum square work envelope can be increased by about 40%. That is just the space productivity needed in modern automation.

Epson SCARA G6 The new efficiency class

The new G6 design allows for a large work envelope at very compact dimensions. The robots can carry out tasks with an arm length of e. g. 550 mm when usually 600 mm would be required. G6 are the ideal solution for applications with a focus on high speed at maximum precision, such as is the case with the production of mechanical and electrical parts, pick-and-place applications, equipping with small parts, dosing or feeding.



Epson G6

Max. payload: 6 kg
Reach: 450/550/
650 mm
Z-stroke: 180/330 mm

Epson SCARA G10 Fast and strong

Ultrafast speed and higher payload? A combination that Epson G10 can perfectly handle due to the high arm rigidity. G10 are fast in every sense of the word — for assembly and configuration as well as for handling with multi-grippers. They use all their advantages particularly in applications such as the assembly of heavy parts, packaging and palletising as well as loading and unloading. Since there are no tubes, the design is very compact.



Epson G10

Max. payload: 10 kg
Reach: 650/850 mm
Z-stroke: 180/420 mm

Epson SCARA G20 Long arm with high strength

Manipulators of the G20 series are suitable for high payloads such as heavy parts or packaging units (up to 20 kg). Since the arm of the G20 is 1,000 mm or 850 mm long, the work envelope is large. Due to the high moment of inertia of the U joint, heavy loads can be handled fast and reliably — without any vibration of the robot arm as is the case for many competition models with a similar arm length.



Epson G20

Max. payload: 20 kg
Reach: 850/1,000 mm
Z-stroke: 180/420 mm

SOLUTIONS WITH SYSTEM — AND FUTURE

Epson SCARA robots prove their strong performance and unparalleled reliability in diverse applications.

Loading and unloading machines

Expectations are high: With high point accuracy, the robot must still move at high speed to achieve the required installation throughput. During loading and unloading, the work pieces are defined on pallets, work carriers or conveyors or they are fed to the installation as bulk material with subsequent separation and passed on after the process. Epson SCARAs carry out these tasks precisely and reliably in pace with the machine cycle.

Assembling and equipping

Manual activities during assembling and equipping are inefficient as well as error-prone. Apart from that, the human arm is naturally limited in its range of motion. Thanks to the optimised ratio of arm 1 and arm 2, Epson SCARAs, on the contrary, have maximum freedom of movement and are able to precisely assemble even the smallest parts. Due to their excellent dynamics, high insertion forces and rigidities as well as the good deadload-payload ratio, Epson robots are perfectly suitable for assembly and equipping tasks — even for small batch sizes.

Packaging and palletising

Modern packagings require a high degree of flexibility of the packaging lines. That is because ever shorter product change times as well as a high process reliability must be ensured. Epson robots package and palletise even highly sensitive parts. With Conveyor Tracking, the robots can also be used for picking up parts from moving conveyors or placing them there. In that process, objects are detected by a camera or sensor.

Testing, measuring and checking

Quality checks, measurements, test runs prior to series production — precise detection is most important here. Epson SCARA robots with the integrated Epson vision system handle these tasks also at high clock rates. The Epson Controller RC700-A master controller allows use with other software and hardware for measuring and checking. Moreover, the master controller can be easily combined with pattern recognition systems or force-torque sensors from other manufacturers. If the product deviates from the tolerance values with respect to the predefined parameters, it is detected as faulty at an early stage and safely sorted out.



SO THAT YOU KNOW BEFOREHAND WHAT YOU WILL NEED LATER

Trial & error — why not? Before using an Epson SCARA robot in your application, you can try, compare and visualise sequences at no risk. Not only in the design phase, but also during integration and operation does the free Epson RC+ Simulator help you save time and money.

The design phase — easy planning and cost reduction

Already during the design phase, you can accurately plan your robot cell quickly and easily and reliably estimate the cycle time for your application. This way, feasibility is proven before a single part of the installation is manufactured. You can also prepare for later installation expansions in the simulation so that the installation must only be shut down when it cannot be avoided.

The integration phase — reducing integration times, avoiding damage

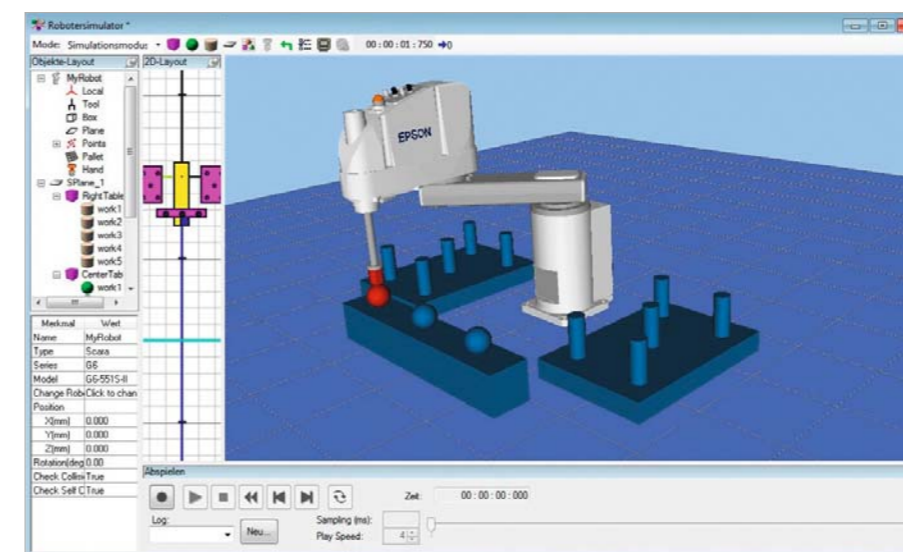
Prior to the robot delivery, an offline program validation is carried out. Programs can be created parallelly and even complex motion sequences can be visualised and evaluated. This serves to detect risks of collision and avoid damage to the equipment.

The operation and maintenance phase — reduction of downtimes

Troubleshooting and program modifications can be comfortably carried out from your office. Collision detection, reachability checks and robot motion are visualised in 3-D.

The Epson RC+ development environment — powerful, efficient, intuitive

With its intuitive Windows operator interface, the open structure and integrated Machine Vision, the powerful Epson RC+ project management and development environment is ideal for the uncomplicated programming of your applications. Now, we have also added a graphical 3-D environment to allow you to almost entirely simulate the robot program and obtain visualised robot motion.



SCARA, 6-axis or the Epson SPIDER — all of these robots as well as different motion sequences can be imaged with the Epson RC+ Simulator.

THE EPSON CONCEPT: TO TAKE IT ONE STEP FURTHER

As a SCARA specialist we aim to permanently optimise every detail of our robot systems – and to reach those aims. How do you benefit? Unequalled repeatability. Improved joining properties. Higher insertion forces and speeds. A space-saving design with reduced interference contours. We could just go on and on and on ...

The Epson SCARA – perfect design with many advantages

High-precision ball screw spline with optimised spline pitch

Status light to indicate the operating state of the motors

User wiring
- 4 air/vacuum lines
- 24 signal points
- wear-resistant
- high availability

Cable unit inside
- space-saving, less interference contours
- reduced mechanical sensitivity
- improved ESD shield

Absolute shaft encoders on all axes
- 21-bit resolution on one motor rotation
- excellent repeatability
- outstanding interpolation
- precise speed control

Monocoque profile
- 2.5 times as rigid as common cast aluminium arms
- higher insertion forces
- optimised joining properties

Shiftable stops for individual mechanical reduction of the work envelope

Low-vibration base
- product-conserving
- improved repeatability and accuracy
- optimised joining properties

Compact, space-saving mounting base

Fitting holes for improved reproducibility of the robot position

Different shaft lengths for different applications

Harmonic Drive gear unit
- backlash-free, low-maintenance
- optimised joining properties
- improved repeatability and accuracy

Optional:
Vertical power/signal cable outlet directly below the base
- compact, clean and safe in cleanrooms
- safe in dirty environments (IP65 applications)

Connections on the Epson SCARA G1

Signal cable

Motor function indicator lamp

Connection for user wiring
1x (9-pin D-sub connector)
1x (15-pin D-sub connector)

Power cable

Brake release button

Three connections for compressed-air supply (1x Ø 4 mm and 2x Ø 6 mm)

Connections on the Epson SCARA G3

Exhaust port for cleanroom models

Motor function indicator lamp

Connection for user wiring
1x (15-pin D-sub connector)

Power cable

Brake release button

Three connections for compressed-air supply (1x Ø 4 mm and 2x Ø 6 mm)

Signal cable

Connections on the Epson SCARA G6, G10 and G20

Connection for user wiring
1x (9-pin D-sub connector)
1x (15-pin D-sub connector)

Signal cable

Brake release button

Power cable

Motor function indicator lamp

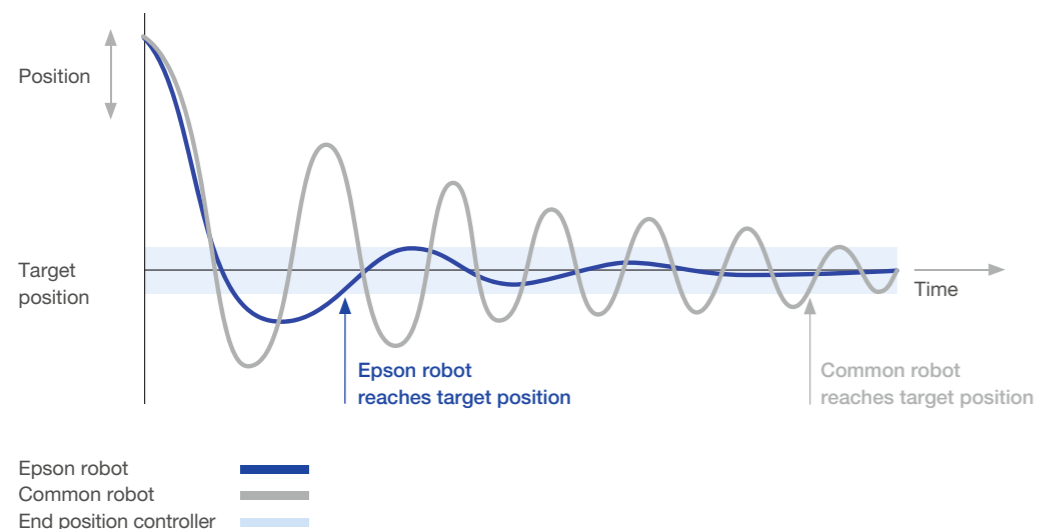
Four connections for compressed-air supply (2x Ø 4 mm and 2x Ø 6 mm)

BECAUSE QUALITY IS THE BEST RECIPE

Just like all other Epson robot systems, robots of the Epson SCARA G-series also feature a great number of advantages. High-quality components ensure longevity and high availability. The design also focuses on reliability — starting from well-established design principles to easy accessibility of all components.

We get to the point fast: Smart Motion

Smart Motion is the revolutionary motor management by Epson used in all Epson robot systems. At low vibration, Epson robots reach the end position much faster and much more precisely. Optimum positioning, short cycle times and increased path accuracy — be on the economical side with Smart Motion!



As a result of overshooting, common motor controllers lead to increased deviations.

The result: imprecise positioning, poor interpolation and longer process times. Epson Smart Motion, however, minimises overshooting. Epson robots are more precise and product-conserving and get to the point faster — even if cycle times are extreme.

The economical and future-oriented complete solution

All main components are Epson products; they are developed in our research centres and produced in our quality-certified manufacturing facilities. Hardware and software match perfectly.

FLEXIBLE CONTROLLER CONCEPT

The G-series Epson SCARA can be optimally controlled via the Epson controller RC700-A and seamlessly integrated into your production processes.

Epson Controller RC700-A - only one, for everyone

This control is a real universal genius, because it has proven capabilities as a stand-alone and an integrated system. If it is extended to create a multi-manipulator controller, the Epson RC700-A, thanks to its open system architecture, can control several robots and various peripherals in a complex system.

Thanks to its multitasking capability (48 multitasks) the RC700-A lets you use your system more effectively and with less errors. Synchronisation takes place using markers and without additional wiring being required.

The flexible controller supports both conveyor tracking and various bus protocols, and interface extensions as well as the powerful Epson image processing systems.

For robots with visual recognition

The integrated Epson Vision Guide 7.0 features a comprehensive tool library. With its functions it can for example detect parts and precisely position them, even where there are manufacturing deviations and varying positions. The image processing software also supports colour cameras and high-resolution cameras.

The image processing systems from Epson are as individual as your requirements. So for example, for the Epson Compact Vision CV2 you do not require a computer for image processing. It allows mobile or permanent connection of up to 6 GigE cameras and 2 USB cameras. The high-speed communication takes place over GigaEthernet.

Teach Pendant TP3

The mobile TP3 terminal features an ergonomic and flat housing with a brilliant, HD ready display. Fast processors allow for sophisticated visualisation and operating applications.



RC700-A



CV2



TP3

Specifications

	EPSON SCARA G1-171S	EPSON SCARA G1-221S	EPSON SCARA G1-171SZ	EPSON SCARA G1-221SZ
DESIGN	4 axes, external oriented horizontal articulated arm		3 axes, external oriented horizontal articulated arm	
PAYLOAD	(kg) nom./max. 0.5/1		(kg) nom./max. 0.5/1.5	
REACH	horizontal (J1+J2) (mm) 175 (75+100) vertical (J3) (mm) 100 or 80 (cleanroom) orientation (J4) (°) +/-360	(mm) 225 (125+100) (mm) 100 or 80 (cleanroom) (°) +/-360	(mm) 175 (75+100) (mm) 100 or 80 (cleanroom)	(mm) 225 (125+100) (mm) 100 or 80 (cleanroom)
REPEATABILITY	horizontal (J1+J2) (mm) +/-0.005 vertical (J3) (mm) +/-0.01 orientation (J4) (°) +/-0.01	(mm) +/-0.008 (mm) +/-0.01 (°) +/-0.01	(mm) +/-0.005 (mm) +/-0.01	(mm) +/-0.008 (mm) +/-0.01
MOMENT OF INERTIA	(kgm ²) nom./max. 0.0003/0.004	(kgm ²) nom./max. 0.0003/0.004	-	-
USER WIRING	electrical D-sub (15-pin + 9-pin) pneumatic tubes (1 x Ø4 mm and 2 x Ø6 mm)			
SHAFT	(mm) Ø 8 h7			
INSERTION FORCE	(N) permanent 50			
WEIGHT	(kg) 8			
CONTROLLER	RC700-A			
MANIPULATOR MODEL	mounting option floor, cleanroom (ISO3) & ESD			
AVAILABLE OPTIONS	longer cables (5 m/10 m/20 m), bellows			

Scope of delivery

- Epson robot and controller
- 1 Epson RC+ program CD including Simulator
- 1 set of mounting brackets for the robot controller
- 70 g grease for shaft
- 1 set 3 m motor and signal cable
- 1 emergency stop connector
- 1 connector for standard I/O
- 1 set connectors for user wiring
- 1 USB programming cable
- Manuals on CD
- 1 installation/safety manual

Manipulator options

- Longer motor and signal cables (5 m / 10 m / 20 m)
- Bellows option: 1 piece bellows for mounting on shaft. Protects spline and environment from dirt.

Dimensions of the Epson SCARA G1

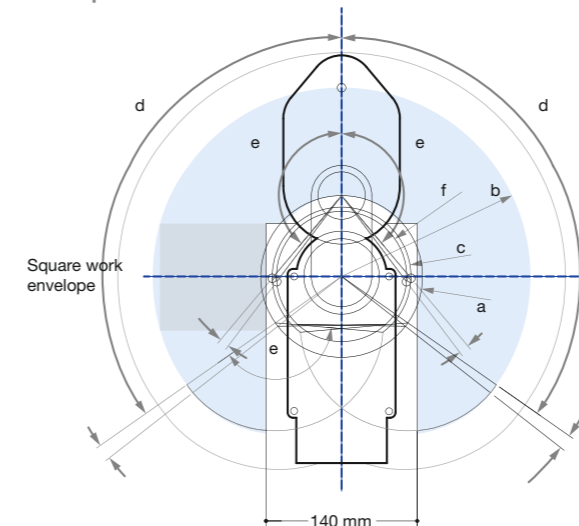
	G1-171S	G1-221S	G1-171SZ	G1-221SZ
	4 axes external oriented horizontal articulated arm			
A	(mm) 75	(mm) 125	(mm) 75	(mm) 125
B	(mm) 515 max.	(mm) 545 max.	(mm) 515 max.	(mm) 545 max.

Work envelope of the Epson SCARA G1

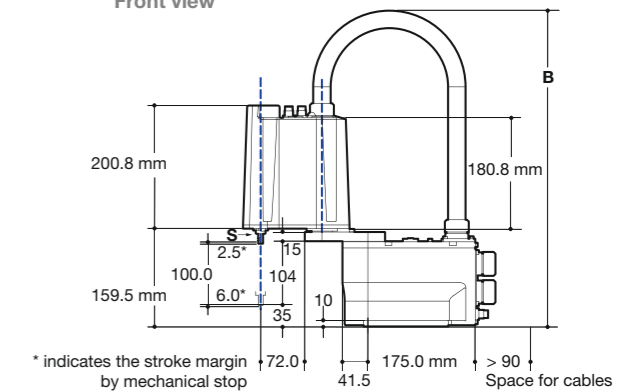
	G1-171S	G1-221S	G1-171SZ	G1-221SZ
	4 axes external oriented horizontal articulated arm			
a	(mm) 75	(mm) 125	(mm) 75	(mm) 125
b-a	(mm) 100	(mm) 100	(mm) 100	(mm) 100
c	(mm) 64.3	(mm) 59.6	(mm) 70.9	(mm) 89.2
d	125°	125°	125°	125°
e	140°	152°	135°	135°
f	(mm) 60.4	(mm) 52.8	(mm) 69.2	(mm) 82.2

- a Length of arm #1
- b Length of arm #2
- c Work envelope
- d Work envelope of axis #1
- e Work envelope of axis #2
- f Area of the mechanical stop

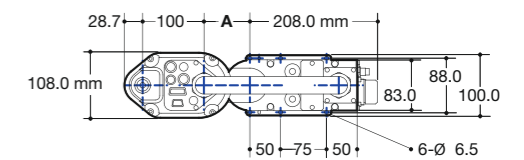
Work envelope of the G1-171S



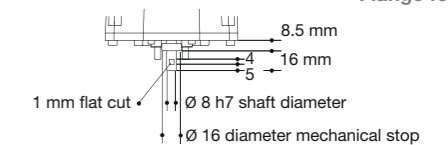
Front view



Top view standard



Flange for hand



Detail of S: Calibration point position of joints #3 and #4

Specifications

	EPSON SCARA G3-251S	EPSON SCARA G3-301S EPSON SCARA G3-301S-L EPSON SCARA G3-301S-R	EPSON SCARA G3-351S EPSON SCARA G3-351S-L EPSON SCARA G3-351S-R
DESIGN	external oriented horizontal articulated arm		
PAYLOAD	(kg) nom./max. 1/3		
REACH	horizontal (J1+J2) (mm) 250 (120+130) vertical (J3) (mm) 150 or 120 (cleanroom) orientation (J4) (°) +/-360	(mm) 300 (170+130) (mm) 150 or 120 (cleanroom) (°) +/-360	(mm) 350 (220+130) (mm) 150 or 120 (cleanroom) (°) +/-360
REPEATABILITY	horizontal (J1+J2) (mm) +/-0.008 vertical (J3) (mm) +/-0.010 orientation (J4) (°) +/-0.005	(mm) +/-0.010 (mm) +/-0.010 (°) +/-0.005	(mm) +/-0.010 (mm) +/-0.010 (°) +/-0.005
MOMENT OF INERTIA	(kgm ²) nom./max. 0.005/0.05	(kgm ²) nom./max. 0.005/0.05	(kgm ²) nom./max. 0.005/0.05
USER WIRING	electrical D-sub (15-pin) pneumatic tubes (1 x Ø4mm and 2 x Ø6 mm)		
SHAFT	(mm) Ø outside/inside 16 h7/11		
INSERTION FORCE	(N) permanent 150		
WEIGHT	(kg) 14		
CONTROLLER	RC700-A		
MANIPULATOR MODEL	mounting option floor cleanroom (ISO3) & ESD	mounting option floor, multi-mount	
AVAILABLE OPTIONS	longer cables (5 m/10 m/20 m), tool adaptor, bellows		

Scope of delivery

- Epson robot and controller
- 1 Epson RC+ program CD including Simulator
- 1 set of mounting brackets for the robot controller
- 70 g grease for shaft
- 1 set 3 m motor and signal cable
- 1 emergency stop connector
- 1 connector for standard I/O
- 1 set connectors for user wiring
- 1 USB programming cable
- Manuals on CD
- 1 installation/safety manual

Manipulator options

- Longer motor and signal cables (5 m / 10 m / 20 m)
- Tool adaptor for easy mounting of end effectors to shaft
- Bellows option: 2 pieces bellows for mounting on shaft. Protects spline and environment from dirt.

Dimensions of the Epson SCARA G3

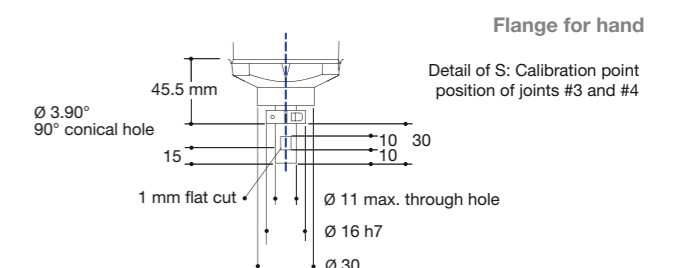
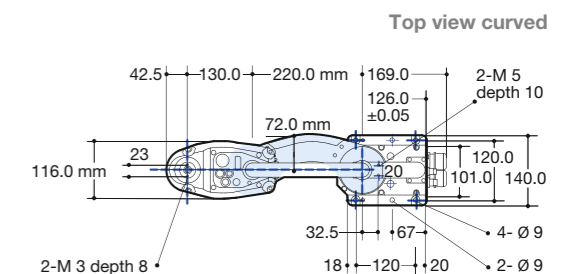
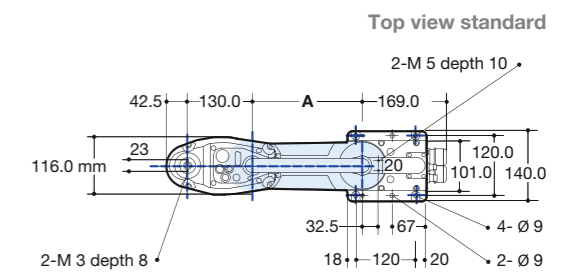
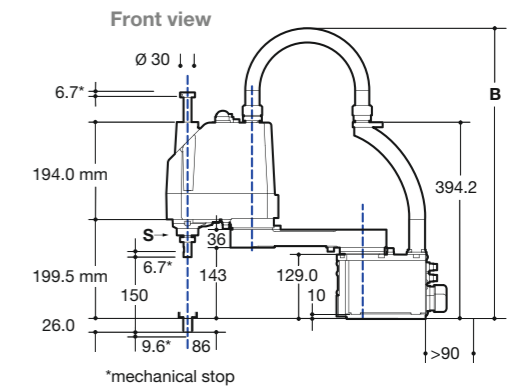
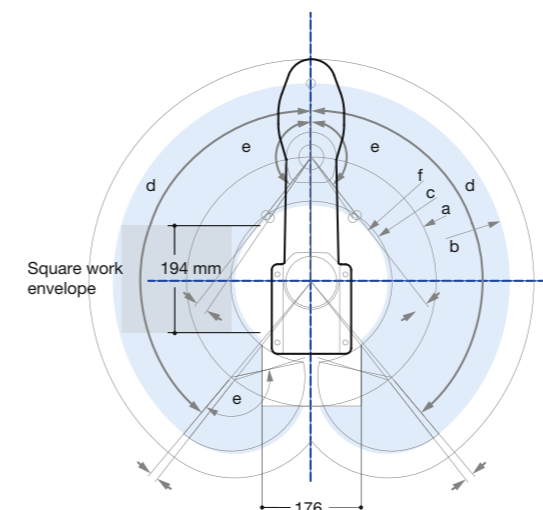
	G3-251S	G3-301S	G3-351S
A	(mm) 120	(mm) 170	(mm) 220
B	(mm) 545 max.	(mm) 575 max.	(mm) 595 max.

Work envelope of the Epson SCARA G3

	G3-251S	G3-301S	G3-351S	G3-301S-L	G3-301S-R	G3-351S-L	G3-351S-R
a	(mm) 120	(mm) 170	(mm) 220	(mm) 170	(mm) 170	(mm) 220	(mm) 220
b-a	(mm) 130	(mm) 130	(mm) 130	(mm) 130	(mm) 130	(mm) 130	(mm) 130
c	(mm) 84	(mm) 104.8	(mm) 142.3	(mm) 120.7	(mm) 120.7	(mm) 191.6	(mm) 191.6
c1	-	-	-	(mm) 86.8	(mm) 86.8	(mm) 100.3	(mm) 100.3
d	140°	140°	140°	150°	125°	165°	110°
d1	-	-	-	125°	150°	110°	165°
e	141°	142°	142°	150°	135°	165°	120°
e1	-	-	-	135°	150°	120°	165°
f	(mm) 79.3	(mm) 96.2	(mm) 134.2	(mm) 79.5	(mm) 79.5	(mm) 97	(mm) 97
f1	-	-	-	(mm) 113.2	(mm) 113.2	(mm) 183	(mm) 183

- a Length of arm #1
- b Length of arm #2
- (c, c1) Work envelope
- (d, d1) Work envelope of axis #1
- (e, e1) Work envelope of axis #2
- (f, f1) Area of the mechanical stop

Work envelope of the G3-351S



This and further information as well as CAD data are available at: www.epson.de/robots

Specifications

	EPSON SCARA G6-45xS	EPSON SCARA G6-55xS	EPSON SCARA G6-65xS
DESIGN	external oriented horizontal articulated arm		
PAYLOAD	(kg) nom./max. 3/6		
REACH	horizontal (J1+J2)	(mm) 450 (200+250)	(mm) 550 (300+250)
	vertical (J3)	x=1 180 or 150 (cleanroom and IP54 and IP65) x=3 330 or 300 (cleanroom and IP54 and IP65)	
	orientation (J4)	(°) +/-360	(°) +/-360
REPEATABILITY	horizontal (J1+J2)	(mm) +/-0.015	(mm) +/-0.015
	vertical (J3)	(mm) +/-0.010	(mm) +/-0.010
	orientation (J4)	(°) +/-0.005	(°) +/-0.005
MOMENT OF INERTIA	(kgm ²) nom./max. 0.01/0.12	(kgm ²) nom./max. 0.01/0.12	(kgm ²) nom./max. 0.01/0.12
USER WIRING	electrical D-sub (15-pin + 9-pin) pneumatic tubes (2 x Ø 4 mm and 2 x Ø 6 mm)		
SHAFT	(mm) Ø outside/inside 20 h7/14		
INSERTION FORCE	(N) permanent 150		
WEIGHT	(kg) 27 floor	(kg) 27 floor	(kg) 28 floor
MOUNTING OPTION	(kg) 27 ceiling	(kg) 27 ceiling	(kg) 28 ceiling
	(kg) 29 wall	(kg) 29 wall	(kg) 29.5 wall
CONTROLLER	RC700-A		
MANIPULATOR MODEL	mounting option floor, wall, ceiling cleanroom (ISO3) & ESD, IP protection class: standard/IP54/IP65		
AVAILABLE OPTIONS	longer cables (5 m/10 m/20 m), tool adaptor, for floor and ceiling mounting: cable outlet directly below or above the base (power/signal cable and user wiring), external wiring unit, bellows		

Scope of delivery

- Epson robot and controller
- 1 Epson RC+ program CD including Simulator
- 1 set of mounting brackets for the robot controller
- 70 g grease for shaft
- 1 set 3 m motor and signal cable
- 1 emergency stop connector
- 1 connector for standard I/O
- 1 set connectors for user wiring
- 1 USB programming cable
- Manuals on CD
- 1 installation/safety manual

Manipulator options

- Longer motor and signal cables (5 m/10 m/20 m)
- Tool adaptor for easy mounting of end effectors to shaft
- External wiring unit: The external empty conduit allows the clean feeding of further user media very near to the corresponding end effector (recommended e.g. for fluid lines).
- Downward cable: Serves as an outlet for motor and signal lines through a hole in the mounting plate directly below the manipulator so that robot cables are not visible in the robot cell (recommended e.g. for cleanroom applications).
- Bellows option: 2 pieces bellows for mounting on shaft. Protects spline and environment from dirt.

Dimensions of the Epson SCARA G6

	G6-45xS	G6-55xS	G6-65xS
A	(mm) 200	(mm) 300	(mm) 400
B		(mm) 180	(mm) 330
C		(mm) 119	(mm) -31
D		(mm) 684	(mm) 834

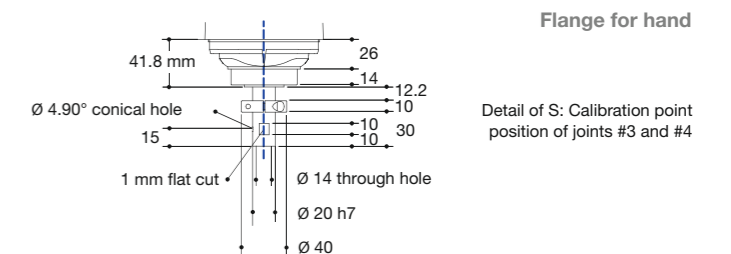
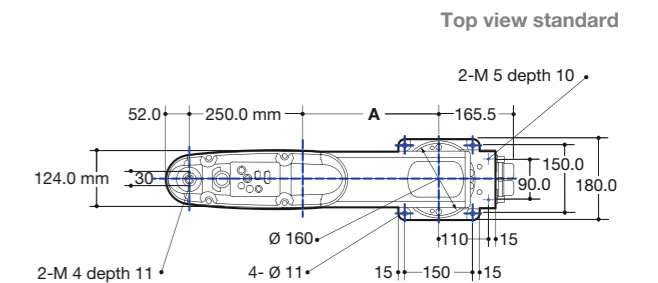
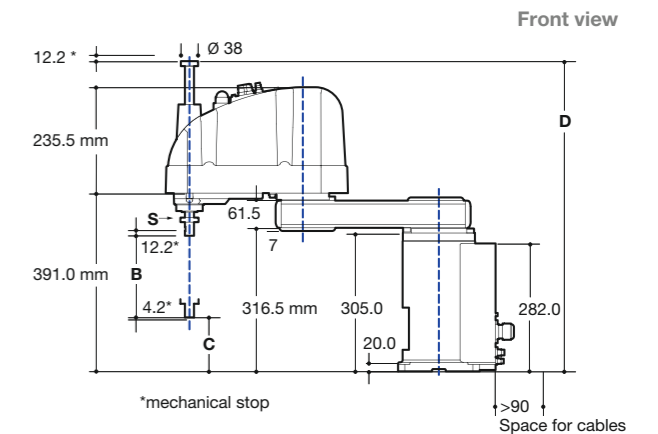
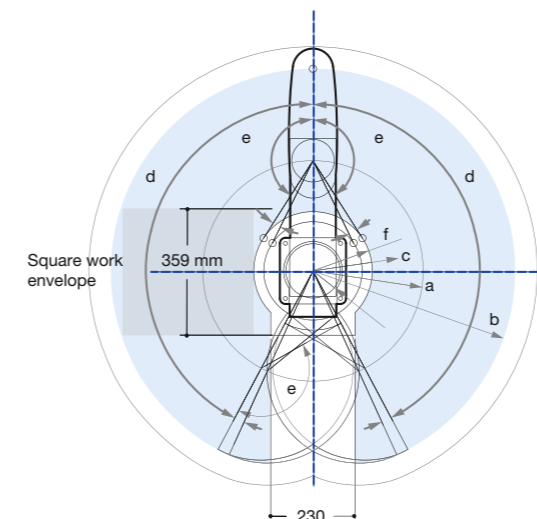
Work envelope of the Epson SCARA G6

	G6-45xS	G6-55xS	G6-65xS
a	(mm) 200	(mm) 300	(mm) 400
b-a	(mm) 250	(mm) 250	(mm) 250
c	Z: 0 to -270	(mm) 134.8	(mm) 161.2
	Z: -270 to -330	(mm) 143.5	(mm) 232
d	152°	152°	152°
e	Z: 0 to -270	147.5°	147.5°
	Z: -270 to -330	145°	147.5°
f	(mm) 124.4	(mm) 133.8	(mm) 207.5

In Z-area: 0 to -270 mm, the area is limited by the collision area of manipulator body and arm.

- a Length of arm #1
- b Length of arm #2
- c Work envelope
- d Work envelope of axis #1
- e Work envelope of axis #2
- f Area of the mechanical stop

Work envelope of the G6-55xS



Specifications

	EPSON SCARA G10-65xS	EPSON SCARA G10-85xS
DESIGN	external oriented horizontal articulated arm	
PAYLOAD	(kg) nom./max. 5/10	
REACH	horizontal (J1+J2)	(mm) 650 (250+400)
	vertical (J3)	x=1 180 or 150 (cleanroom and IP54 and IP65) x=4 420 or 390 (cleanroom and IP54 and IP65)
	orientation (J4)	(°) +/-360
REPEATABILITY	horizontal (J1+J2)	(mm) +/-0.025
	vertical (J3)	(mm) +/-0.010
	orientation (J4)	(°) +/-0.005
MOMENT OF INERTIA	(kgm ²) nom./max. 0.02/0.25	(kgm ²) nom./max. 0.02/0.25
USER WIRING	electrical D-sub (15-pin + 9-pin) pneumatic tubes (2 x Ø 4 mm and 2 x Ø 6 mm)	
SHAFT	(mm) Ø outside/inside 25 h7/18	
INSERTION FORCE	(N) permanent 250	
WEIGHT	(kg) 46 floor	(kg) 48 floor
MOUNTING OPTION	(kg) 46 ceiling	(kg) 48 ceiling
	(kg) 51 wall	(kg) 53 wall
CONTROLLER	RC700-A	
MANIPULATOR MODEL	mounting option floor, wall, ceiling cleanroom (ISO3) & ESD, IP protection class: standard/IP54/IP65	
AVAILABLE OPTIONS	longer cables (5m/10m/20m), tool adaptor, for floor and ceiling mounting: cable outlet directly below or above the base (power/signal cable and user wiring), external wiring unit, bellows	

Scope of delivery

- Epson robot and controller
- 1 Epson RC+ program CD including Simulator
- 1 set of mounting brackets for the robot controller
- 70 g grease for shaft
- 1 set 3 m motor and signal cable
- 1 emergency stop connector
- 1 connector for standard I/O
- 1 set connectors for user wiring
- 1 USB programming cable
- Manuals on CD
- 1 installation/safety manual

Manipulator options

- Longer motor and signal cables (5m/10m/20m)
- Tool adaptor for easy mounting of end effectors to shaft
- External wiring unit: The external empty conduit allows the clean feeding of further user media very near to the corresponding end effector (recommended e.g. for fluid lines).
- Downward cable: Serves as an outlet for motor and signal lines through a hole in the mounting plate directly below the manipulator so that robot cables are not visible in the robot cell (recommended e.g. for cleanroom applications).
- Bellows option: 2 pieces bellows for mounting on shaft. Protects spline and environment from dirt.

Dimensions of the Epson SCARA G10

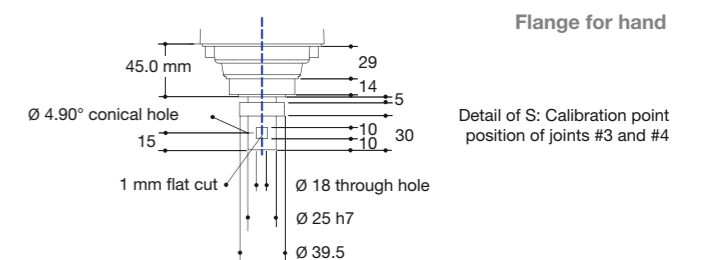
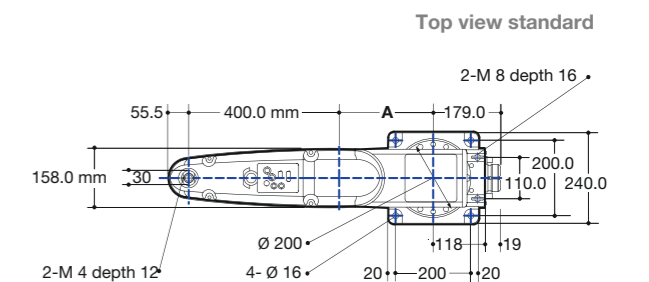
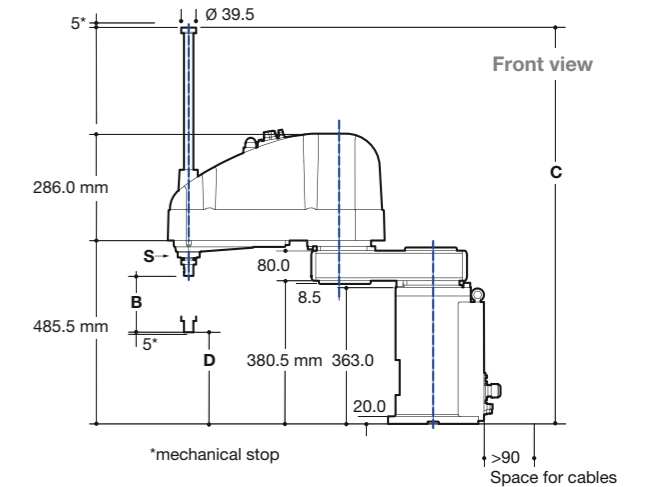
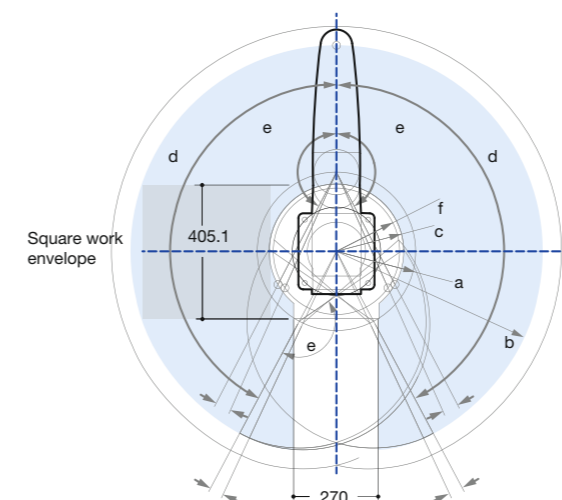
	G10-65xS	G10-85xS	G10-XX1S	G10-XX4S
A	(mm) 250	(mm) 450		
B			(mm) 180	(mm) 420
C			(mm) 813.5	(mm) 1,053.5
D			(mm) 213.5	(mm) -26.5

Work envelope of the Epson SCARA G10

	G10-65xS	G10-85xS
a	(mm) 250	(mm) 450
b-a	(mm) 400	(mm) 400
c	(mm) 212.4	(mm) 207.8
d	152°	152°
e	152.5°	152.5°
f	(mm) 199.4	(mm) 183.3

- a Length of arm #1
- b Length of arm #2
- c Work envelope
- d Work envelope of axis #1
- e Work envelope of axis #2
- f Area of the mechanical stop

Work envelope of the G10-65xS



Specifications

	EPSON SCARA G20-85xS	EPSON SCARA G20-A0xS
DESIGN	external oriented horizontal articulated arm	
PAYLOAD	(kg) nom./max. 10/20	
REACH	horizontal (J1+J2)	(mm) 850 (450+400)
	vertical (J3)	x=1 180 or 150 (cleanroom and IP54 and IP65) x=4 420 or 390 (cleanroom and IP54 and IP65)
	orientation (J4)	(°) +/-360
REPEATABILITY	horizontal (J1+J2)	(mm) +/-0.025
	vertical (J3)	(mm) +/-0.010
	orientation (J4)	(°) +/-0.005
MOMENT OF INERTIA	(kgm ²) nom./max. 0.05/0.45	(kgm ²) nom./max. 0.05/0.45
USER WIRING	electrical D-sub (15-pin + 9-pin) pneumatic tubes (2 x Ø 4 mm und 2 x Ø 6 mm)	
SHAFT	(mm) Ø outside/inside 25 h7/18	
INSERTION FORCE	(N) permanent 250	
WEIGHT	(kg) 48 floor	(kg) 50 floor
MOUNTING OPTION	(kg) 48 ceiling	(kg) 50 ceiling
	(kg) 53 wall	(kg) 55 wall
CONTROLLER	RC700-A	
MANIPULATOR MODEL	mounting option floor, wall, ceiling cleanroom (ISO3) & ESD, IP protection class: standard/IP54/IP65	
AVAILABLE OPTIONS	longer cables (5m/10m/20m), tool adaptor, for floor and ceiling mounting: cable outlet directly below or above the base (power/signal cable and user wiring), external wiring unit, bellows	

Scope of delivery

- Epson robot and controller
- 1 Epson RC+ program CD including Simulator
- 1 set of mounting brackets for the robot controller
- 70 g grease for shaft
- 1 set 3 m motor and signal cable
- 1 emergency stop connector
- 1 connector for standard I/O
- 1 set connectors for user wiring
- 1 USB programming cable
- Manuals on CD
- 1 installation/safety manual

Manipulator options

- Longer motor and signal cables (5m/10m/20m)
- Tool adaptor for easy mounting of end effectors to shaft
- External wiring unit: The external empty conduit allows the clean feeding of further user media very near to the corresponding end effector (recommended e.g. for fluid lines).
- Downward cable: Serves as an outlet for motor and signal lines through a hole in the mounting plate directly below the manipulator so that robot cables are not visible in the robot cell (recommended e.g. for cleanroom applications).
- Bellows option: 2 pieces bellows for mounting on shaft. Protects spline and environment from dirt.

Dimensions of the Epson SCARA G20

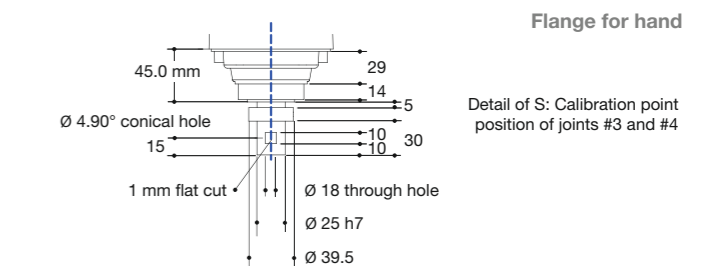
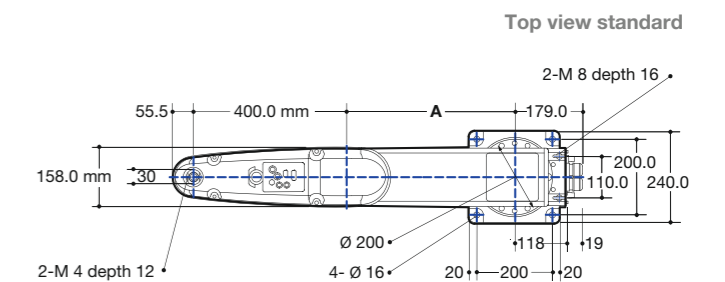
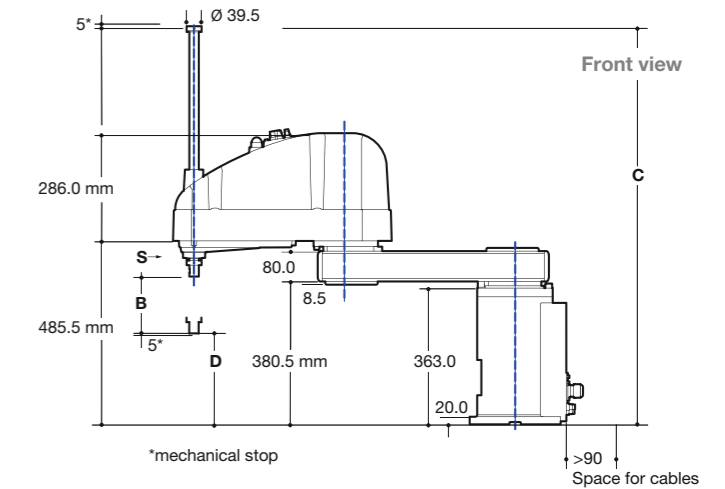
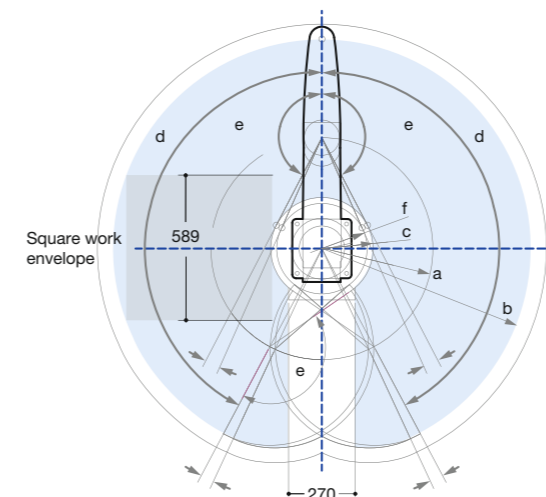
	G20-85xS	G20-A0xS	G20-XX1S	G20-XX4S
A	(mm) 450	(mm) 600		
B			(mm) 180	(mm) 420
C			(mm) 813.5	(mm) 1,053.5
D			(mm) 213.5	(mm) -26.5

Work envelope of the Epson SCARA G20

	G20-85xS	G20-A0xS
a	(mm) 450	(mm) 600
b	(mm) 400	(mm) 400
c	(mm) 207.8	(mm) 307
d	152°	152°
e	152.5°	152.5°
f	(mm) 183.3	(mm) 285.4

- a Length of arm #1
- b Length of arm #2
- c Work envelope
- d Work envelope of axis #1
- e Work envelope of axis #2
- f Area of the mechanical stop

Work envelope of the G20-85xS



EFFICIENTLY USING RESOURCES

Reduced mass but increased power. Optimised efficiency. Compact design but a larger work envelope. We always consider the next step. It is not all about the initial investment, but also about the operating and follow-up costs of our robots in your application. Our aim: to be efficient in every way.

More power in reduced space

Slim design and minimised weight lead to considerable savings in operating costs. Compared to previous models, we have reduced our G-series by 10% in height, for example. Since the robots have no tubes and the user wiring inside, the design is particularly compact.

Larger work envelope

We have increased the working range of our SCARA kinematics by an average 23%. The result is a work envelope which is equal to that of non-Epson robots of the next bigger size.

Higher speed

We have achieved an average increase in axis speed of 20%, just the same as the payload. Every kinematics has the highest position accuracy of its class.

High efficiency, optimised ratio of supplied energy and payload

All Epson robots stand out for a particularly low power consumption. That way, electric energy is converted into kinetic energy so as to achieve high efficiency and short cycle times.

Economical – also in the long run

The combination of maximum reliability, a reduced number of components and reusability of components results in a high added value.



THE GREEN WAY: ENVIRONMENT AND SUSTAINABILITY

Environmental protection has a long tradition at Epson and is an integral part of the company philosophy. It is our aim to reduce the environmental impact of our products – from the concept to recycling, from the choice of materials and components to transport to reuse.

Saving energy – and costs

Energy is money and a real economic factor. Therefore, we consistently strive to develop particularly reliable, failsafe products which consume less and less energy. Since 1995, Epson has implemented an environmental management system based on a holistic approach.

Environmental Vision 2050 – our goals

With our Environmental Vision 2050, we set an example. One of our main intentions is to reduce our CO₂ emissions during the complete life cycle of a product by 90% by 2050. Moreover, we are going to introduce reuse and recycling for all of our products and are engaged in protecting biodiversity.

Sustainable and environmentally friendly

Within the framework of our sustainability initiative, we have committed ourselves to high ethical and ecological standards. The annual “Epson Sustainability Report” documents how we ensure and continuously improve the good environmental performance of our products and production processes.

Life cycle assessment

Since the year 2000, we have been registering the environmental impact of individual items of our manufacturing program. Life cycle assessment gives information about how much raw material and energy a product consumes within the course of its production, use and disposal and what emissions are generated.

Download the “Sustainability Report” at: <http://global.epson.com/SR/environment>

Better Products for a Better Future™

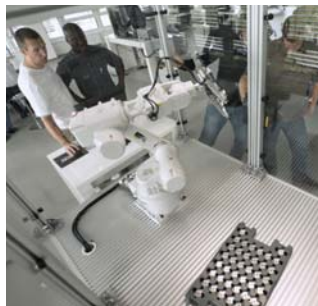


Epson Industry Solutions Center – that's where we find your solution!

Expertise concentrated on 500 m²: In cooperation with our partners, in our Meerbusch Industry Solutions Center we present solutions for the most diverse applications in industry. The fields include large format printing, retail solution and factory automation.

Factory automation: See all Epson robots in action. Our experts help you to set up, simulate and optimise your automation application in a workshop cell. The cell can be controlled and networked with all standard fieldbuses. In addition, we provide up-to-date peripheral equipment such as a Vision and Conveyor Tracking system.

You would like to arrange an appointment?
Call us at +49 2159 538 1800 or just e-mail us at:
robot.infos@epson.de



Epson Deutschland GmbH
Factory Automation Division
Otto-Hahn-Straße 4
40670 Meerbusch

Phone: +49 2159 538 1800
Fax: +49 2159 538 3170
E-mail: robot.infos@epson.de
www.epson.de/robots

Seiko Epson Corporation
INDUSTRIAL SOLUTIONS
OPERATION DIVISION
6925 Tazawa, Toyoshina,
Azumino-shi

399-8285 Nagano-ken
Tel.: +81 26372 1530
Fax: +81 26372 1495
[http://global.epson.com/
products/robots/](http://global.epson.com/products/robots/)

Epson America Inc.
Factory Automation Division
18300 Central Avenue
Carson, CA 90746

Phone: +15 62290 5910
Fax: +15 62290 5999
E-mail: info@robots.epson.com
www.robots.epson.com

Epson China Co, Ltd.
7F, Jinbao Building,
No. 89 Jinbao Street
Dongcheng District
Beijing 100005, China

Phone: +86 10 8522 1199 259
Fax: +86 10 8522 1125 259
www.epson.com.cn