

SCARAFLEX®

More safety & flexibility for your production facility



TECHNICAL SPECIFICATIONS

SCARAFLEX®

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SCARAFLEX® – an innovation made in Austria



A / GENERAL INFORMATION

1 / INTRODUCTION

SCARAFLEX® is a safety system that enables the reliable operation of Epson Scara robots without the need for a protective enclosure.

The system comprises a pressure-sensitive, protective sensory skin and a monitoring unit, which limits the robot's permissible speed. If a collision is detected by the protective sensory skin or if the permissible speed is exceeded, the robot is immediately stopped before any risk arises. SCARAFLEX® is an all-in-one system and requires no further components for reliable operation. It can be purchased as an upgrade kit together with a new Scara robot in order to retrofit older robots (even units up to five years old).

2 / AIRSKIN® PADS

The **AIRSKIN® Pads** are sensory pads, which completely sheath all moving parts of the Scara robot in the directions of movement. The AIRSKIN® serves to immediately stop the robot when it collides with a person or machine. The system is connected to the door safety circuit and disconnects it as soon as a collision is detected. In addition to the collision detection function, the soft surface structure also distributes any force transferred in the event of a collision, absorbs it and optimally distributes it across the collision surface. It therefore minimises any risks arising in connection



with the collision pressure. In the event of damage to or leakage of the pads, the robot stops and displays the current status of the pad by means of a colour code.

3 / SPEEDGUARD

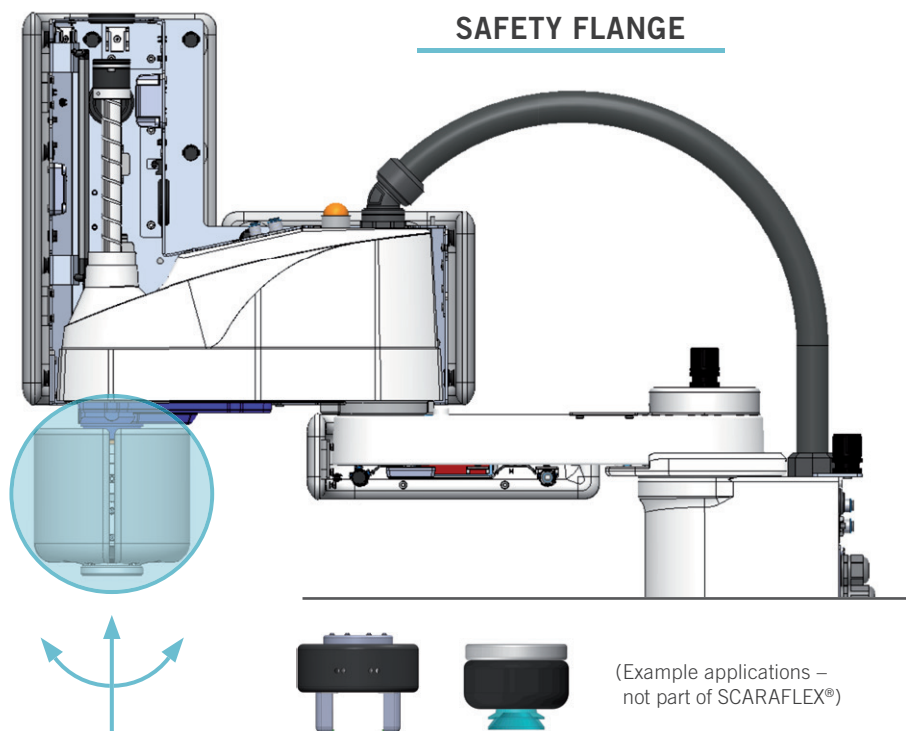
An additional function of SCARAFLEX® is throttling the robot's application speed. In the process, the **Speedguard** measures the robot's speed using multiple acceleration sensors and compares it against the learned speed limit values. If the measured speed of the robot exceeds the saved limit values, the robot is stopped. If there is no error or fault affecting the robot, it can be reactivated with the push of a button.

Please note: If you are interested in further SCARAFLEX® documents, please ask us. You can also download these documents directly here: scaraflex.com/downloads.

4 / SAFETY FLANGE

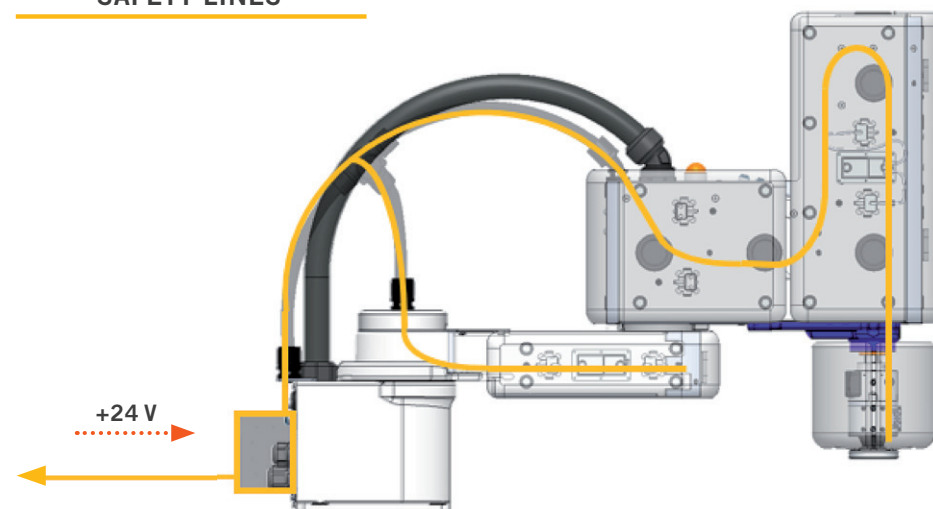
The **safety flange** is a safety component located on the inner end of the spindle. The gripper mounting plate of the safety flange is spring-loaded and gives way in the event of a collision. It detects any changes in angle, rotation and compressions and immediately stops the robot. It thereby reduces any risk of injury and damage to property in the event of a collision.

In addition to the safety functions specified to date, the safety flange has an AIRSKIN® Pad, which completely covers the contour and is therefore also able to detect collisions through a change in pressure. The robot gripper is mounted on the safety flange and benefits from its safety functions. As a result, SCARAFLEX® provides the perfect interface for a collaborative gripper.



5 / COMMUNICATION

REDUNDANT SAFETY LINES



It is connected to the door safety circuit of the robot control system

The **internal components** of SCARAFLEX® are serially connected to one another via two redundant safety lines. These safety lines function as a bus system, through which communication occurs. The safety lines are also connected to the door safety circuit of the robot control circuit. If a participant reports a safety breach, the redundant safety lines are disconnected. As a result, the door safety circuit of the robot is disconnected and the robot is stopped.

A safety breach can be a collision of the pads, impermissible overrunning of the safety speed or the unauthorised deployment of the safety flange with the gripper. The robot stops in the event of an error message or damage to the pads and displays this by means of a colour code on the applicable component.

6 / SAFETY

All SCARAFLEX® components are certified safety components.

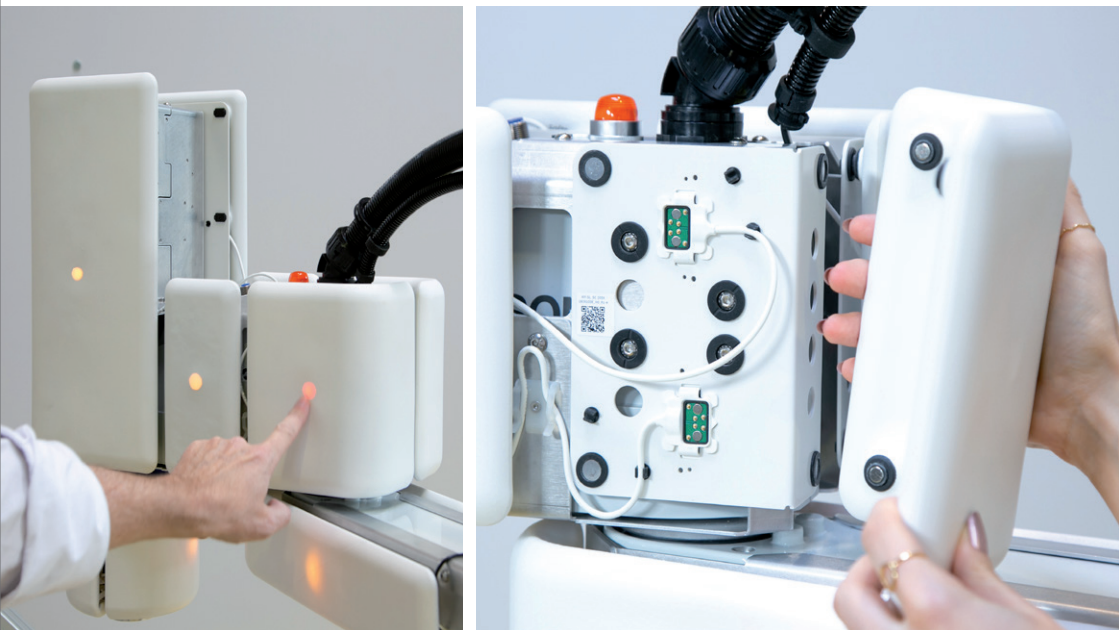
Product: AIRSKIN® by Blue Danube Robotics

ISO 13849-1 Cat 3 / Pl-e
IEC 62061 SILCL 3



The total safety level that can be reached through a combination of SCARAFLEX® with an Epson Scara is *Pl-d*.

SCARAFLEX® is a safety device that enables safe, fence-free applications (comparable to a safety switch). Nonetheless, it is still the responsibility of the integrator to design and implement the entire application taking into account applicable technical standards and regulations.



SUMMARY

WHY SCARAFLEX®?

- Precise, long-lasting mechanics with a reliable control system and proven EPSON options (e.g., conveyor tracking, vision, etc.)
- Straightforward risk assessment for integrators in the form of basic Scara kinematics ("zone model")
- Soft baffles, which permit higher speeds during the application (ca. 500 mm/s, head collision excluded in accordance with ISO TS 14066)
- When the robot is not operating, it can be moved by hand
- Existing robots can be retrofitted with SCARAFLEX®; it can also be removed if need be
- The AIRSKIN® technology that is used is certified and approved worldwide as a safety sensor.

AN INNOVATION MADE IN AUSTRIA

Equipped with decades of experiences in the field of robot applications and a close partnership with **EPSON**, **Economa Engineering** from Austria has successfully introduced this innovative safety feature to the market after nearly four years of development.

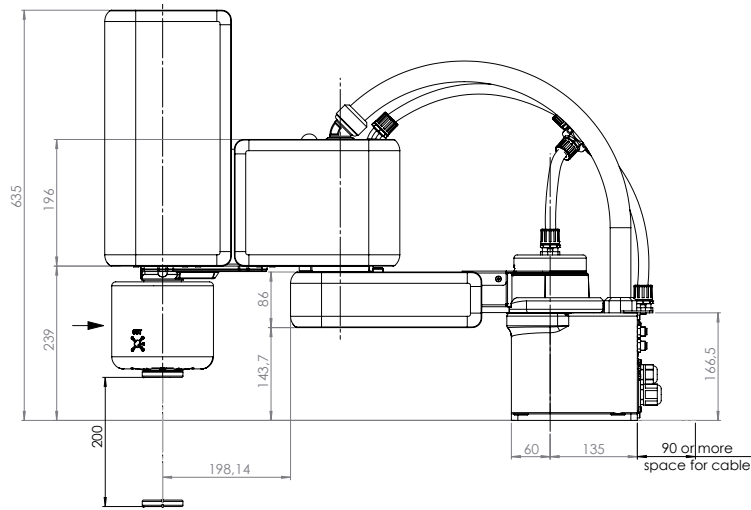
ECONOMA Engineering is an automation specialist located in South Vienna and is a big name when it comes to high-tech developments. Numerous high-profile manufacturers like Melecs EWS, but also institutions like Münze Österreich AG rely on expertise from this Viennese family-owned and operated company.



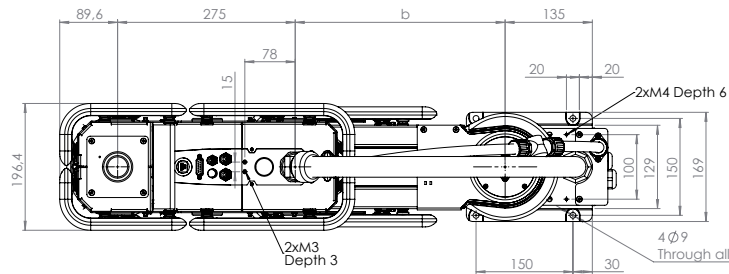
B / SPECIFICATIONS

LS6/600/700

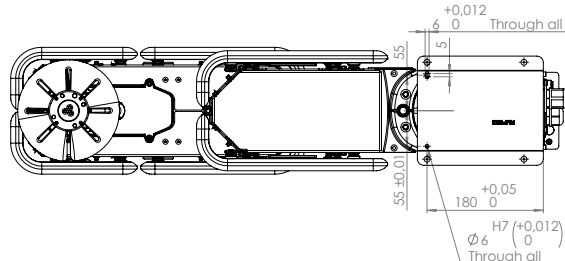
Side view



Overhead view



Rear view



		EPSON LS6-B602S		SCARAFLEX® LS6/600	EPSON LS6-B702S		SCARAFLEX® LS6/700
Load-bearing capacity *1	Nom. (kg m²)	2			2		
	Max. (kg m²)	6		5	6		5
Arm length	(J1 + J2)	600			700		
	(J1)	325			425		
	(J2)	275			275		
Repetition accuracy	(J1 + J2) mm	+/- 0,02			+/- 0,02		
	(J1) mm	+/- 0,01			+/- 0,01		
	(J2) mm	+/- 0,01			+/- 0,01		
	(J3) mm	+/- 0,01			+/- 0,01		
	(J4) Degrees	+/- 0,01			+/- 0,01		
Standard cycle time (sec)		0,42		n.a.	0,43		n.a.
Maximum movement range	(J1) Degrees	+/- 132°		112,5°	+/- 132°		112,5°
	(J2) Degrees	+/- 150°		141°	+/- 150°		141°
	(J3) mm	200			200		
	(J4) Degrees	+/- 360			+/- 360		
Maximum axial speed *2	(J1 + J2) mm / s	7.850		800*3	8.590		800*3
	(J3) mm / s	1.110		220*3	1.110		220*3
	(J4) Degrees / s	2.000		n.a.	2.000		n.a.
(J4) Permissible moment of inertia	Nom. (kg m²)	0,01			0,01		
	Max. (kg m²)	0,12			0,12		
(J3) Pressing force (N)		100			100		
Mounting type		Floor			Floor		
Installation environment		Standard / IP 20			Standard / IP 20		
Weight (in kg, without cable)		17		23,5	18		25
Insertable controller		RC90-B			RC90-B		
Cable lengths *4		3,5,10		3,5,10	3,5,10		3,5,10
Power supply		230 V		24 V (external)	230 V		24 V (external)

EPSON SAFETY STANDARDS
Compliant with EU regulation*5, KC, KCs
ANSI/RIA R15.062-2012, NFPA 79 (version from 2007)

SCARAFLEX® SAFETY STANDARDS
Compliant with EU Regulation*5, KC, KCs ANSI/RIA R15.062-2012, NFPA 79 (version from 2007).
Assembled from safety components, which were certified in accordance with ISO 13849 (PLe/Cat 3).

*1 Permissible maximum load not exceeded.

*4 Only standard cables are available.

*2 Maximum axial speed without the SCARAFLEX® option measured with 2 kg load on the spindle.

*5 As the robot is built and used in the customer's system, a "Declaration of Incorporation of Partly Completed Machinery" is contained in the robot scope.

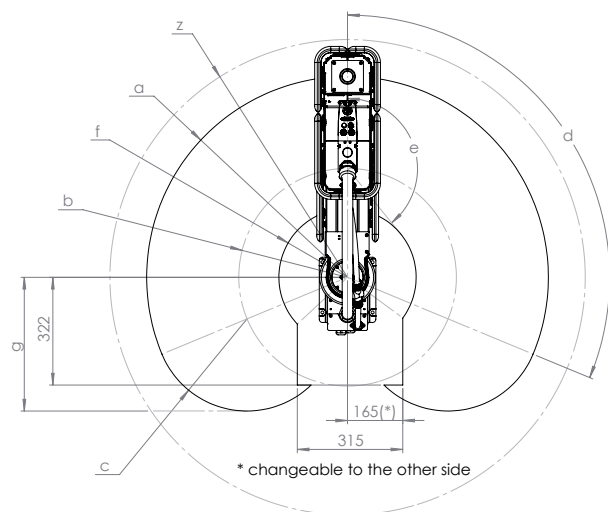
*3 This is the maximum speed permitted by the "safe speed" feature limit. This value is stored in the Scaraflex firmware and cannot be changed.

SCARAFLEX® is a safety option for EPSON robots made of safety components certified in accordance with ISO 13849 (PL-e/Kat3). Each of the specified robot types has been fitted with SCARAFLEX® and subjected, by an independent expert, to a risk assessment with full measurement of the force and compressive effect in accordance with ISO/TS 15066, DGV FB-HM 080 and RIA TR R15.806-2018.

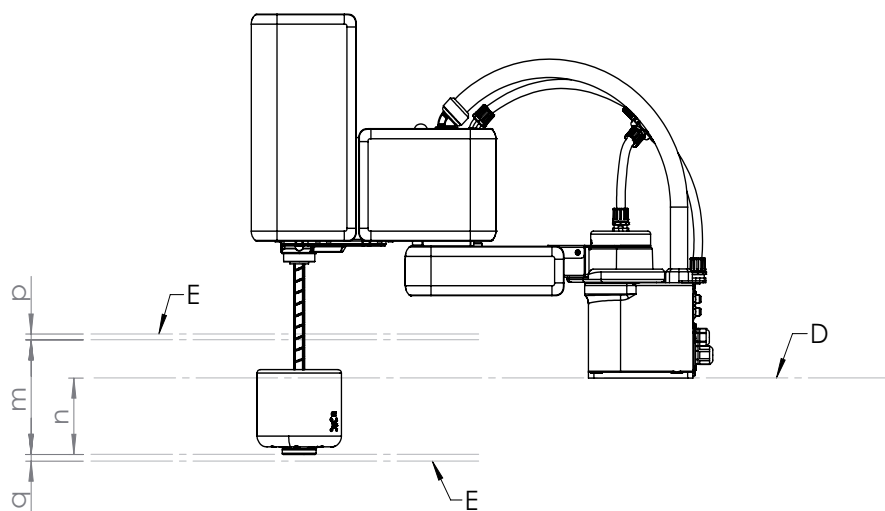
This certificate only applies to SCARAFLEX® in connection with the relevant robot type. The integrator for the entire application (analysis of the robot, with the gripper and the product in the application environment) continues to be responsible for performing its own risk assessment with a force-compressive force measurement.

Work area

Overhead view

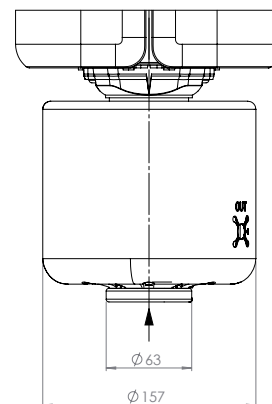


Side view

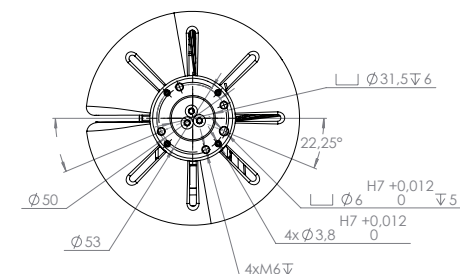


Detection flange

Side view



View from below



		EPSON LS6-B602S	SCARAFLEX® LS6 / 600	EPSON LS6-B702S	SCARAFLEX® LS6 / 700
a	Length of arm no.1 & arm no. 2 (mm)	600		700	
b	Length of arm no. 1 (mm)	325		425	
c	Length of arm no. 2 (mm)	275		275	
d	(J1) Movement angle (degrees)	132°	112,5°	132°	112,5°
e	(J2) Movement angle (degrees)	150°	141°	150°	141°
f	Movement range (mm)	162,6	205	232	275
g	Movement range back (mm)	492,6	399,4	559,4	437,6
h	Angle of the (J1) mechanical stop (degrees)	2,8	n.a.	2,8	n.s.
i	Angle of the (J2) mechanical stop (degrees)	2,8	n.s.	2,8	n.s.
j	Mechanical stop area (mm)	142,5	n.s.	214	n.s.
k	Mechanical stop area back (mm)	504	n.s.	574,5	n.s.
m	(J3) Movement range (mm)	200		200	
n	Distance from the mounting base (mm)	51	66,65	51	66,65
p	(J3) Upper mechanical stop range (mm)	10		10	
p	(J3) Bottom mechanical stop range (mm)	11,8		11,8	
z	Room without collision (mm)	n.a.	710	n.a.	810

A = Middle of axis 3 (tool center point)
 B = Movement range
 C = Maximum range
 D = Mounting base
 E = Area limited by mechanical stop

CONTACT US!

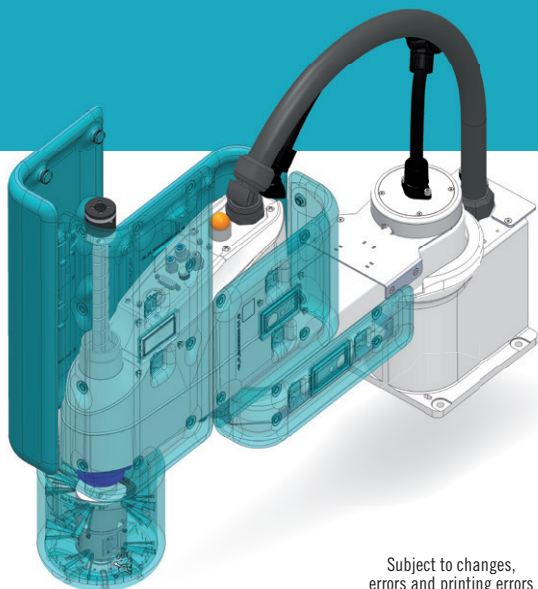
Any questions about SCARAFLEX®?

Then don't hesitate to contact us via email or phone
– we are happy to serve you as a manufacturer!

E-Mail: info@scaraflex.com
Phone: +43 1 596 1000

SCARAFLEX® sales partners

If you are interested in SCARAFLEX® and would like to purchase
one of our products, please visit our sales page:
www.SCARAFLEX.com/sales



www.scaraflex.com



Certified to

> ISO 13849 > IEC 62061
> Cat 3/PLe > SILCL 3

Subject to changes,
errors and printing errors

EPSON