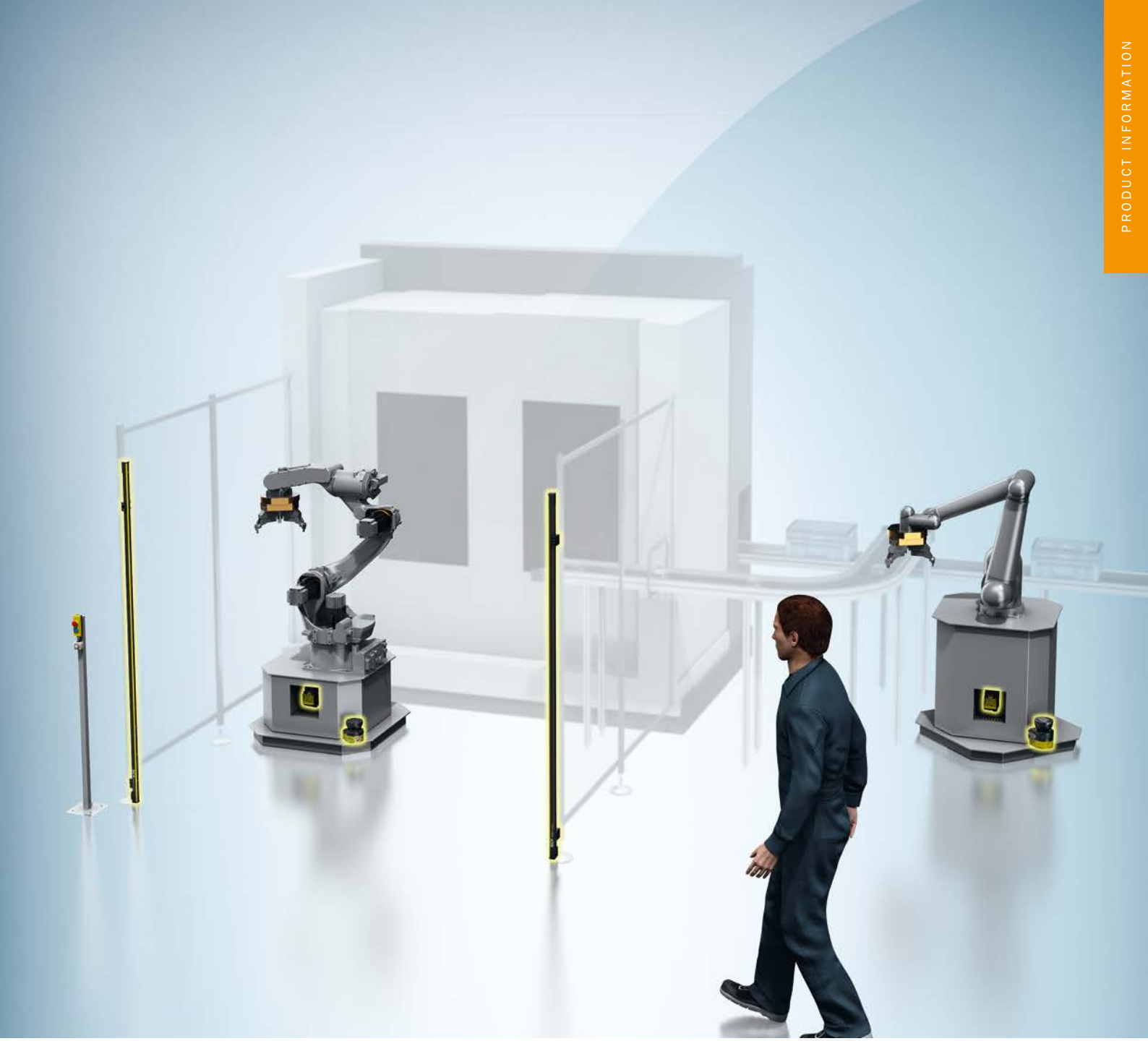
PRODUCT INFORMATION



Safe Robotics Area Protection

OPEN ACCESS FOR MAXIMUM PRODUCTIVITY

Safety systems

SICK
Sensor Intelligence.

SAFE PRODUCTIVITY IN ROBOTICS APPLICATIONS

Robotics applications are now nearly indispensable as an addition to and support for work processes in order to live up to ever-growing competitive pressure in modern industry. Such robotics applications enable flexible adaptation to changing production conditions while keeping product quality at the same consistently high level. The challenge when using industrial robots is to ensure that people can access the robot system unhindered at any time, yet be protected against all possible dangers.

An optimal safety system should not only make working environments safer, it aims to take productivity to a new level. The Safe Robotics Area Protection safety system from SICK permits unrestricted and safe access to the hazardous area of the robot. It ensures safe human-robot interaction, reduces machine downtime at the same time and enables high performance of your robotics application. Thanks to optimal work processes, the worker can concentrate completely on the activities and does not have to open and close safety doors. The safety system also offers the option of automatically restarting the robot. It can be integrated simply and flexibly into robotics applications.

With the **sBot Speed** and **sBot Stop** variants, Safe Robotics Area Protection offers the option of protecting freely accessible robotics applications depending on the respective needs.

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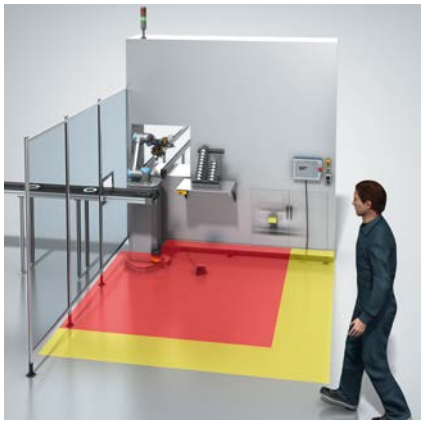
Safe Robotics Area Protection – product family overview

sBot Speed

➜ see page 4

sBot Speed – UR

➜ see page 6



sBot Stop

➜ see page 8

Aiming for high productivity

Smooth and free access to the working area of the robot while preventing unnecessary machine stops providing the option of automatic restart.

Guaranteeing safety

Unlimited and safe access to the hazardous area of the robot at all times enables safe human-robot interaction.

Future-proof investment

Ready-to-use and proven safety components from SICK provide a high level of flexibility when applying Safe Robotics Area Protection in different work situations and environments.

Saving time and money

Easy integration into robot controls thanks to safe ready-made and tested functional logic and detailed operating instructions.

The fields of application for Safe Robotics Area Protection

Processing industry

- For machine assembly and pick-and-place fitting

Mounting

- For packaging processes and palletizing

Production

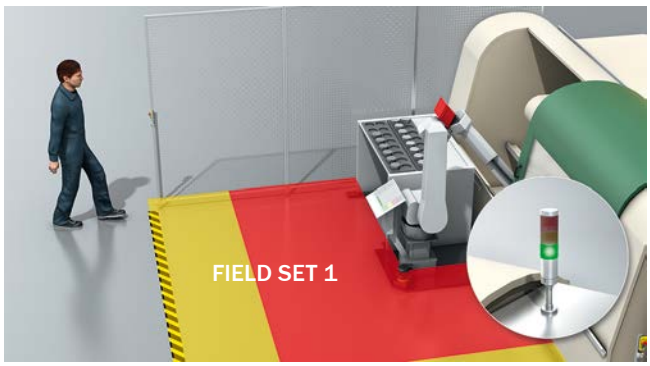
- For drilling, screwdriving and inspection processes

sBot Speed – WITH SPEED REDUCTION FOR LESS DOWNTIME

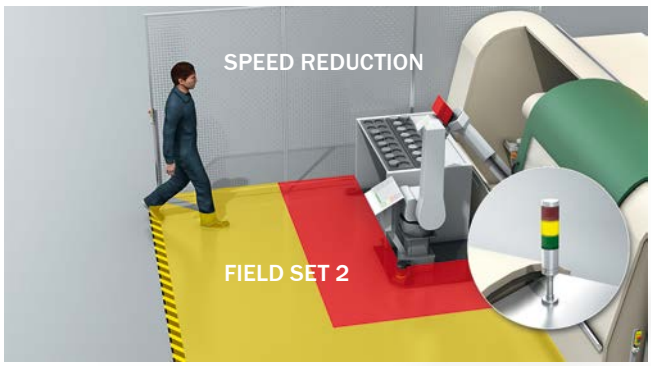
The sBot Speed safety system ensures safety and flexibility because it intelligently combines the functions of a safety laser scanner with those of the Flexi Soft safety controller. The non-safe automation functions and the safe functions have been ready-made and tested, meaning that the sBot Speed is easy to integrate into the most common robot controls. The safety system adapts the robot operating conditions to the respective position of the worker. After the worker has left the hazardous area of the robot, sBot Speed triggers the automatic restart* of the robot. This increases productivity, as downtime are reduced and workflows optimized. The robot's speed adjustment function also extends its service life.

* This function may only be used if permitted by the risk assessment and all requirements for the use of this safety system are fulfilled.

Principle of operation based on a CNC machine



1 With sBot Speed, the safety laser scanner uses two different field sets which consist of a warning (yellow) and a protective field (red). The minimum distance of each protective field must be defined based on the robot speed.



2 If a worker enters the warning field, the safety controller initiates a reduction of the robot speed. When the safely reduced speed is reached, dynamic protective field adaptation takes place: The safety system switches from field set 1 to field set 2, whose protective field (marked red in the figure) is smaller than that of field set 1.

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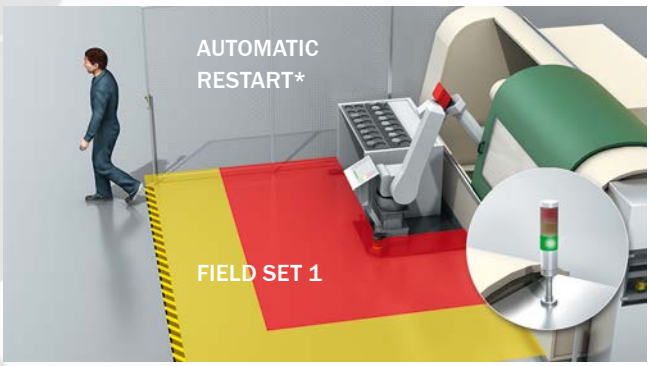

3 The robot stops when the worker enters the protective field.

4 When the worker exits the hazardous area, the robot restarts automatically after additional sequence monitoring*, with reduced speed at first. As soon as the person leaves the protective field and warning field, the robot accelerates back to full speed.

* This function may only be used if permitted by the risk assessment and all requirements for the use of this safety system are fulfilled.

sBot Speed – SYSTEM COMPONENTS AND VARIANTS

sBot Speed

Variant 1 Variant 2

In addition to the hardware components, SICK offers

- Wiring diagram for system integration into the most common robot controls
- Safety functions (available for implementation into the safety controller)
- SISTEMA file
- Operating instructions

sBot Speed – UR

In addition to the hardware components, SICK offers

- Wiring diagram for system integration into Universal Robots (UR) robot controls
- Safety functions (available for implementation into the safety controller)
- SISTEMA file
- Operating instructions with UR safety configuration settings and description of the required control switches

sBot Speed – UR OPTIMALLY TUNED TO UR ROBOTICS APPLICATIONS

sBot Speed – UR is optimally tuned to Universal Robots models UR3, UR5 and UR10 and, in addition to the general benefits of sBot Speed, offers other benefits adapted specifically to the features of UR robots.

- Consideration of the two operating modes “running mode” and “programming mode” common for UR robots in order to enable the operating staff to program the UR robot.
- sBot Speed – UR offers a description of the additional safety components required to comply with safety standards, e.g. reset pushbutton and operating mode selector switch, and enables easy integration of these safety components into the robotics application
- All necessary UR-specific parameter settings, wiring diagram and SISTEMA file are contained in the detailed documentation and ensure quick commissioning of the safety system

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FUNCTIONS

- Activation of safety-rated, monitored speed
- Safe protective field switching
- Triggering of safety stop at the robot
- Triggering of automated restart* after additional sequence monitoring
- Triggering of emergency stop, if necessary
- Prevention of expected robot start-up if the requirements for automatic restart are not fulfilled
- Initiation of speed reduction of the robot when people approach the hazardous area
- Selection of the UR operating mode via switch

* This function may only be used if permitted by the risk assessment and all requirements for the use of this safety system are fulfilled.

THE BENEFITS OF sBot Speed AND sBot Speed – UR

Excellent productivity – less downtime

- Automated restart of the robot allows the worker's workflows to be optimized, increasing productivity
- Two-stage reduction and increase in robot speed reduces wear, thereby increasing the service life of the robot
- Easy and free access to the working range of the robot by the worker

Ensuring safety on all levels

- Protection of the hazardous area for freely-accessible robotics applications with adaptation of the robot operating conditions to the worker position
- Tested safety system - proven combination of reliable safety components
- SICK has more than 60 years of experience in the area of safety technology
- Performance level PL d (ISO 13849) for a high level of safety

Future proof – for greater investment protection

- Easy-to-expand safety system – additional safety functions can be conveniently implemented in the safety controller at any time
- High level of flexibility for use in various work situations and environments thanks to safety laser scanner with protective field adaptation

Cost savings due to quick commissioning

- Easy system integration into the most common robot controls saves time and money
- Detailed operating instructions taking into account all necessary safety standards and requirements provide assistance with system integration and protection of the robotics application
- Automatic restart of the robot with sequence monitoring minimizes costs which can accrue due to unnecessary machine downtime and production outages

sBot Stop – THE COMPACT SOLUTION WHEN SPACE IS TIGHT

sBot Stop combines the functions of a safety light curtain or a multiple light beam safety device for access monitoring, of a laser scanner for presence detection or of a non-programmable Flexi Classic safety controller in an intelligent manner. The safety system can be integrated easily with the robot control and allows for compact machine design with minimal safety distance to the hazardous point thanks to the short response time of the safety light curtain or the multiple light beam safety device.

Principle of operation

1 The safety system is characterized by two protective devices. A safety light curtain or a multiple light beam safety device is the primary protective device for access control in the robotics application. A safety laser scanner is the secondary protective device.

2 If the worker interrupts the light beams of the primary protective device, the robot stops.

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3 The secondary protective device detects whether people are located in the protective field and ensures that the robot remains safely stopped as long as the worker is in the hazardous area.

4 Depending on the application, the safety system offers the option of performing a manual or automatic restart*. It is only reset when the worker has left the hazardous area.

* This function may only be used if permitted by the risk assessment and all requirements for the use of this safety system are fulfilled.

sBot Stop – SYSTEM COMPONENTS AND VARIANTS

sBot Stop is available in 11 variants. For example, the safety system combines the functions of a safety light curtain or a multiple light beam safety device with a safety laser scanner or a non-programmable safety controller including safety logistics. This can be configured with a rotary switch.

In addition to the hardware components, SICK offers

- Wiring diagram for system integration into the most common robot controls
- Safety functions, can be selected by a rotary switch in the safety controller
- SISTEMA file
- Operating instructions

THE BENEFITS AT A GLANCE

Excellent productivity – less downtime

- Free access to the working range of the cooperative robotics application ensures optimized work processes, less downtime and higher productivity
- Safety functions are available as ready-made, tested functional logic for the non-programmable Flexi Classic safety controller and can be selected quickly and easily via rotary switch

Ensuring safety on all levels

- Protection of the hazardous area for freely-accessible robotics applications
- Combination of proven safety components from SICK for a safe robotics application with low space requirements
- Performance level PL d (ISO 13849) for a high level of safety

Cost savings due to quick commissioning and low space requirements

- Easy system integration - safety logic can be configured via rotary switch and the wiring diagram of the safety system is available as a download
- Compact machine design – thanks to the quick response times of the safety light curtain or the multiple light beam safety device as a primary protective device, a short safety distance to the hazardous point is possible
- Detailed documentation simplifies system integration into all the most common robot controls while taking into account all relevant safety norms and standards

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FUNCTIONS

- Triggering of safety stop at the robot
- Triggering of automatic restart* of the robot – depending on the variant
- Manual resetting only possible if the primary and secondary protective devices are not interrupted
- Prevention of unexpected robot start-up

* This function may only be used if permitted by the risk assessment and all requirements for the use of this safety system are fulfilled.

SELECTION GUIDE FOR sBot Speed AND sBot Stop

			
Features	**sBot Speed**	**sBot Speed – UR**	**sBot Stop**
Robot type			
Generic	■		■
Universal Robots		■	
Type of robot stop			
With previous speed reduction	■	■	
Immediate stop			■
Restart* of the robot			
Automatic	■	■	■
Manual			■
Opto-electronic protective device			
Safety laser scanner	■	■	■
Safety light curtain or multiple light beam safety device			■
Control for safety logistics			
Programmable Flexi Soft safety controller	■	■	
Non-programmable Flexi Classic safety controller			■
Main benefit of the safety system			
Flexibility	■	■	
Reduced space required			■
Page	➜ 13		➜ 18

OPEN ACCESS FOR MAXIMUM PRODUCTIVITY

Product description

Safety systems from SICK such as Safe Robotics Area Protection are the starting point for safe interaction between humans and robots: This system enables safe, cooperative, and freely accessible robot applications. Safe Robotics Area Protection consists of safety sensors, a safety controller, and functional logic with safety and non-safety functions. Thanks to the instructional documentation and pretested safety logic, the system can be integrated easily into robot controls and expanded flexibly. Safe Robotics Area Protection ensures that robots and operators work together on a cooperative basis and can share the same workspace. This reduces downtimes, optimizes work processes, and increases productivity.

At a glance

- Safety functions thanks to ready-made, tested functional logic
- Proven safety logic triggers robot safety functions
- Performance level PL d
- Automated robot restart possible

Your benefits

- Free, safe access to cooperative robot applications for high productivity, low downtimes, and optimum work processes
- High flexibility as the system is easy to adapt to the robot application and production environment
- Future-proof, as it can be flexibly expanded
- Detailed documentation for robot integration, compliant with relevant standards
- Low costs as the system is easy to integrate into common industrial robot controllers, thanks to generic or specific safety systems
- Reliable safety for your plant – proven safety logic, developed by SICK experts

Additional information

→ www.sick.com/Safe_Robotics_Area_Protection

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.

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sBot Speed and sBot Speed – UR

Detailed technical data

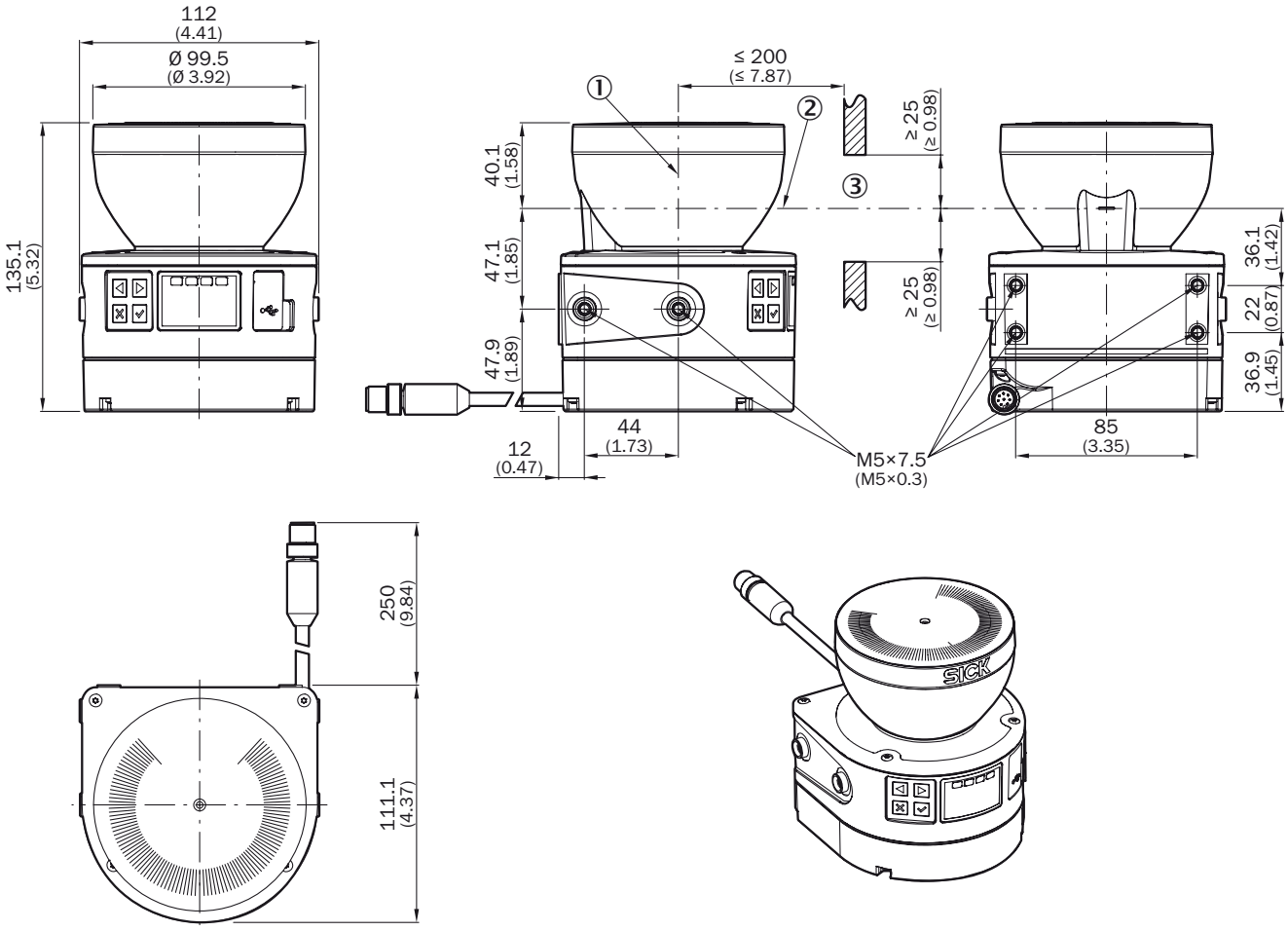
	sBot Speed	sBot Speed – UR
Safety task	Hazardous area protection	
Stopping process of the robot	With speed reduction	
Robot restart	Automatic	
Focused on robot type	Generic	Universal Robots: UR3, UR5, UR10 Robot controller of type CB3.0 or CB3.1
Performance level	PL d (ISO 13849-1)	
Supply voltage V_S	24 V DC (16.8 V DC ... 28.8 V DC)	
Ambient operating temperature	–10 °C ... +50 °C	
Storage temperature	–20 °C ... +50 °C	
Air humidity	50 °C, 90% relative humidity (EN 61131-2)	
Safe state in the event of a fault	The safety-related semiconductor outputs are in the OFF state.	
Safety laser scanner	microScan3 Core I/O / S300 Mini Remote (depending on type)	S300 Mini Remote
Protective field range	5.5 m / 3 m (depending on type)	3 m
Safety controller included	Flexi Soft	
Safety controller type	Programmable	

Ordering information

Variant	Focused on robot type	Safety controller included	Safety laser scanner included	Protective field range	Type	Part no.
sBot Speed	Generic	Flexi Soft: 1 x system plug MPL0 1 x main module CPU1 2 x I/O module XTIO 2 x relay module UE410-4RO4	microScan3 Core I/O	5.5 m	SAPPB2D-08X0039	1093376
			S300 Mini Remote	3 m	SAPPB2D-08X0040	1093377
sBot Speed – UR	Universal Robots: UR3, UR5, UR10	Flexi Soft: 1 x system plug MPL0 1 x main module CPU1 3 x I/O module XTIO	S300 Mini Remote	3 m	SAPPB2D-08X0041	1096129

Dimensional drawings (Dimensions in mm (inch))

microScan3 Core I/O



① Mirror axis of rotation
② Scan plane
③ Required viewing slit

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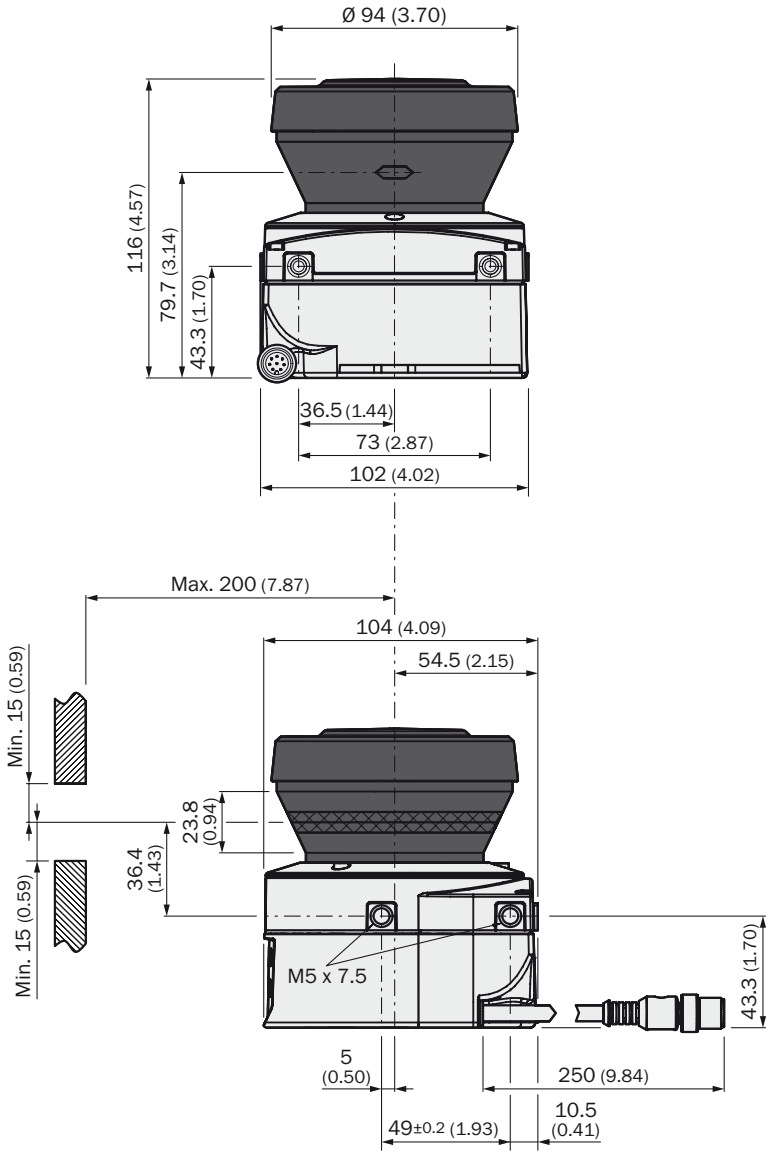
S300 Mini Remote



Accessories required for commissioning

The following accessories are required for commissioning but not included in the delivered safety system.

Description	Number	Usage	microScan3 Core I/O	S300 Mini Remote	Flexi Soft
Connecting cable, female connector, M12, 7-pin, flying leads	1	For connecting S300 Mini Remote with Flexi Soft	–	●	–
Connecting cable, female connector, M12, 8-pin, flying leads	1	For connecting microScan3 Core I/O with Flexi Soft	●	–	–
Connection cable, USB-A, Mini-USB	1	For configuration of microScan3 Core I/O	●	–	–
Connection cable, USB-A, male connector, M8, 4-polig	1	For configuration of S300 Mini Remote or Flexi Soft	–	●	●

Accessories

Mounting systems

Mounting brackets

Figure	Description	Packing unit	Type	Part no.			
	Mounting bracket with protection of optics hood	1 piece	Mounting kit 1b	2074242	●	–	–
	Mounting bracket for rear mounting on wall or machine with protection of optics hood	1 piece	Mounting kit 1b	2034325	–	●	–

Connection systems

Connecting cables

Figure	Connection type		Length of cable	Type	Part no.			
	Female connector, M12, 7-pin, straight	Flying leads	5 m	DOL-1SS2G5M0E15KM3	6042338	–	●	–
			10 m	DOL-1SS2G10ME15KM3	6042340	–	●	–
			15 m	DOL-1SS2G15ME15KM3	6042341	–	●	–
			20 m	DOL-1SS2G20ME15KM3	6042342	–	●	–
	Female connector, M12, 8-pin, straight	Flying leads	5 m	DOL-1208G05MD25KM1	2079315	●	–	–
			10 m	DOL-1208G10MD25KM1	2079316	●	–	–

Connection cables

Figure	Connection type		Length of cable	Type	Part no.			
	USB-A	Mini-USB	3 m	Connection cable (male connector-male connector)	6042517	●	–	–
	USB-A	Male connector, M8, 4-pin, straight	2 m	DSL-8U04G02M025KM1	6034574	–	●	●
			10 m	DSL-8U04G10M025KM1	6034575	–	●	●

Additional components required

The additionally needed components are not included in the scope of delivery. Further information on the requirements for the additionally needed components can be found in the operating instructions. Download ➜ www.sick.com

	sBot Speed	sBot Speed – UR
Emergency stop pushbutton	✔ [1)] ➜ Suitable emergency stop pushbuttons from SICK can be found in the following table	
Reset pushbutton	✔ ➜ Suitable reset pushbuttons from SICK can be found in the following table	
Operating mode selector switch	✔ (has to be integrated in the robot pendant or in the robot controller)	✔ (external device required)
Three-position enabling device	✔ (has to be integrated in the robot pendant)	✔ (external device required)

[1)] At least two emergency stop devices must be installed, e.g., emergency stop pushbuttons. Depending on the risk assessment, it may be necessary to install additional emergency stop pushbuttons.

Emergency stop pushbuttons and reset pushbuttons

Figure	Product family	Description	Connection type	Type	Part no.
	ES21	Emergency stop pushbutton	Cable gland, 2 x M20	ES21-SA10E1	6036147
				ES21-SB10E1	6041507
	ES11	Emergency stop pushbutton	Male connector, M12, 4-pin	ES11-SA1A4	6051327
		Emergency stop pushbutton with reset pushbutton	Male connector, M12, 8-pin	ES11-SC4D8	6051329
	ER12	Reset pushbutton	Male connector, M12, 4-pin	ER12-SB3C4	6051330

Accessories for emergency stop pushbuttons and reset pushbuttons

Figure	Connection type		Conductor cross-section	Length of cable	Type	Part no.	ES11-SA1A4	ES11-SC4D8	ER12-SB3C4
	Female connector, M12, 4-pin, straight	Flying leads	0,34 mm²	10 m	YF2A14-100VB3XLEAX	2096236	●	–	●
				15 m	YF2A14-150VB3XLEAX	2096237	●	–	●
	Female connector, M12, 8-pin, straight	Flying leads	0,25 mm²	10 m	YF2A18-100UA5XLEAX	2095654	–	●	–
				15 m	YF2A18-150UA5XLEAX	2095679	–	●	–

sBot Stop

Detailed technical data

Features

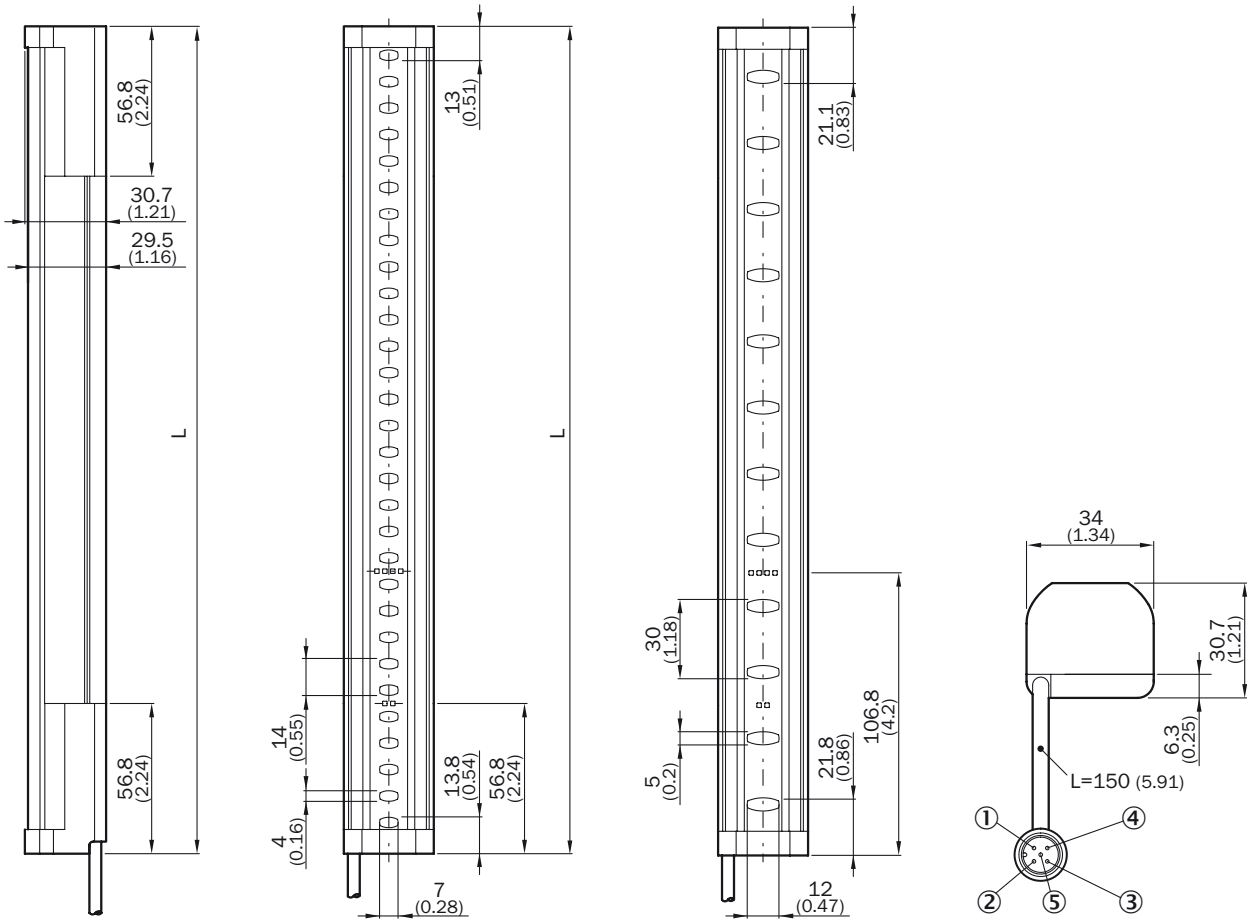
Safety task	Hazardous area protection
Stopping process of the robot	Stop only
Robot restart	Manual / automatic (depending on type)
Focused on robot type	Generic
Performance level	PL d (ISO 13849-1)
Supply voltage V_S	24 V DC (16.8 V DC ... 28.8 V DC)
Ambient operating temperature	–10 °C ... +50 °C
Storage temperature	–20 °C ... +50 °C
Air humidity	50 °C, 90% relative humidity (EN 61131-2)
Safe state in the event of a fault	The safety-related semiconductor outputs are in the OFF state.
Safety sensors	
Primary protective device	Safety light curtain / Multiple light beam safety devices (depending on type)
Secondary protective device	Safety laser scanner
Safety light curtain	deTec4 Core
Protective field height	1,200 mm / 1,500 mm (depending on type)
Resolution	30 mm
Scanning range	15 m
Multiple light beam safety devices	deTem4 Core
Number of beams	4
Beam separation	300 mm
Scanning range	17 m
Safety laser scanner	microScan3 Core I/O / S300 Mini Standard / S3000 Standard (depending on type)
Protective field range	5.5 m / 3 m / 5.5 m (depending on type)
Safety controller included	Flexi Classic
Safety controller type	Non programmable

Ordering information

Robot restart	Safety controller included	Primary protective device (access detection)	Secondary protective device (presence detection)	Type	Part no.
Automatic	Flexi Classic: 1 x main module MU4T0 1 x input module 8DI	Safety light curtain deTec4 Core Protective field height: 1,500 mm Resolution: 30 mm	Safety laser scanner microScan3 Core I/O Protective field range: 5.5 m	SAPPB2D-08X0049	1097909
			Safety laser scanner S300 Mini Standard Protective field range: 3 m	SAPPB2D-08X0047	1097907
		Multiple light beam safety devices deTem4 Core Number of beams: 4 Beam separation: 300 mm	Safety laser scanner microScan3 Core I/O Protective field range: 5.5 m	SAPPB2D-08X0050	1097911
			Safety laser scanner S300 Mini Standard Protective field range: 3 m	SAPPB2D-08X0048	1097908
Manual	Flexi Classic: 1 x main module MU4T0	Safety light curtain deTec4 Core Protective field height: 1,200 mm Resolution: 30 mm	Safety laser scanner microScan3 Core I/O Protective field range: 5.5 m	SAPPB2D-08X0051	1098639
			Safety laser scanner S3000 Standard Protective field range: 5.5 m	SAPPB2D-08X0053	1098641
		Safety light curtain deTec4 Core Protective field height: 1,500 mm Resolution: 30 mm	Safety laser scanner microScan3 Core I/O Protective field range: 5.5 m	SAPPB2D-08X0045	1097905
			Safety laser scanner S300 Mini Standard Protective field range: 3 m	SAPPB2D-08X0043	1097902
			Safety laser scanner S3000 Standard Protective field range: 5.5 m	SAPPB2D-08X0052	1098640
		Multiple light beam safety devices deTem4 Core Number of beams: 4 Beam separation	Safety laser scanner microScan3 Core I/O Protective field range: 5.5 m	SAPPB2D-08X0046	1097906
			Safety laser scanner S300 Mini Standard Protective field range: 3 m	SAPPB2D-08X0044	1097904

Dimensional drawings (Dimensions in mm (inch))

deTec4 Core



Protective field height	L
1,200 (47.24)	1,213 (47.76)
1,500 (59.06)	1,512 (59.53)

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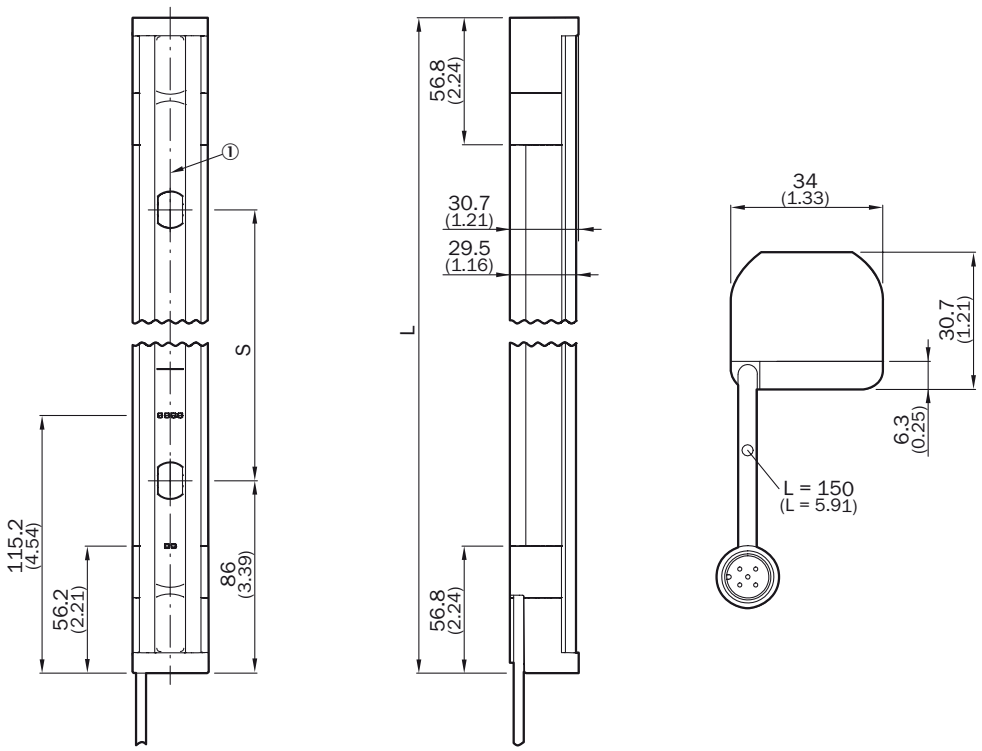
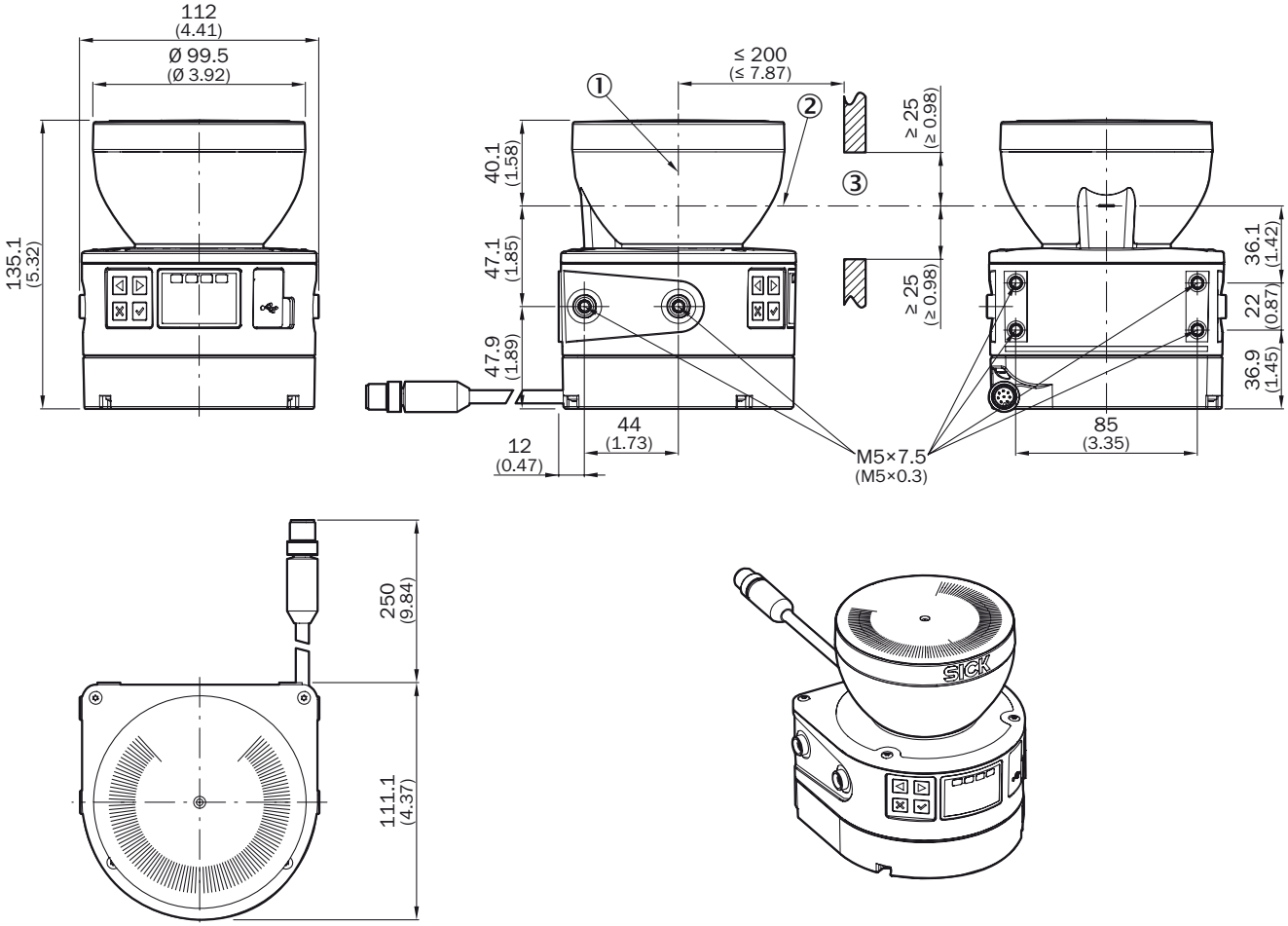
deTem4 Core



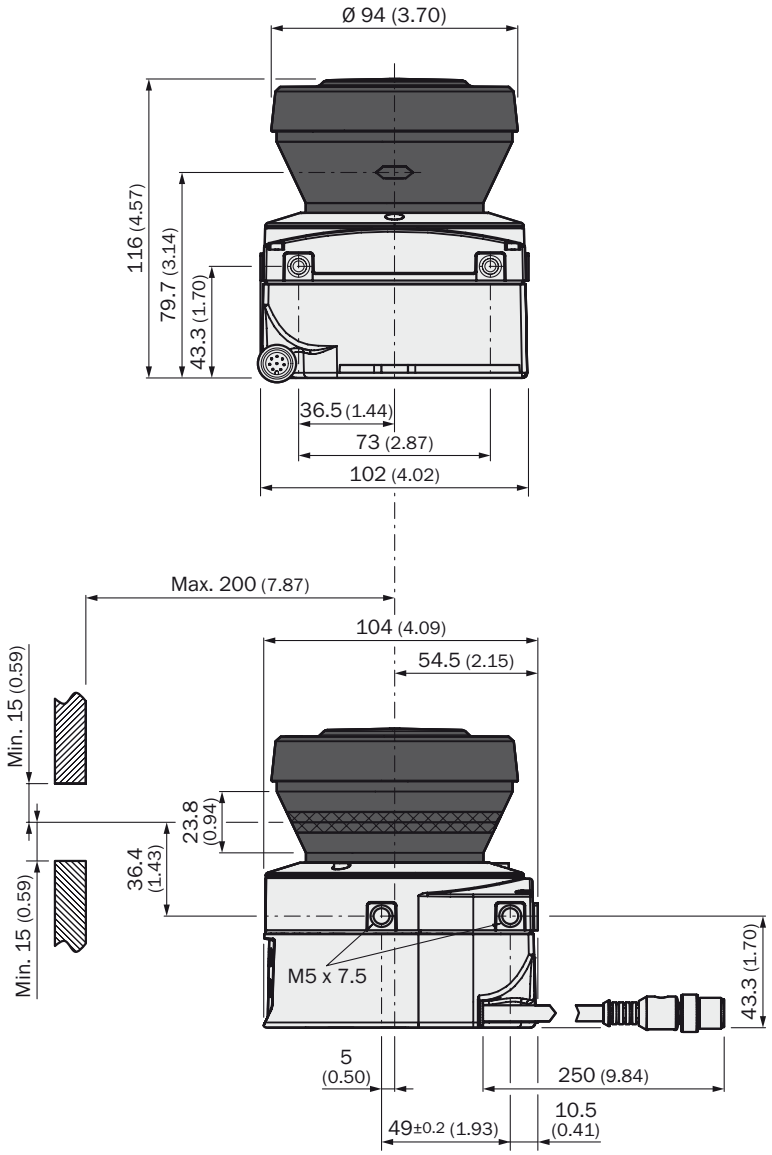
Number of beams	S (Beam separation)	L (Length)
4	300 (11.81)	1,072 (42.20)

microScan3 Core I/O

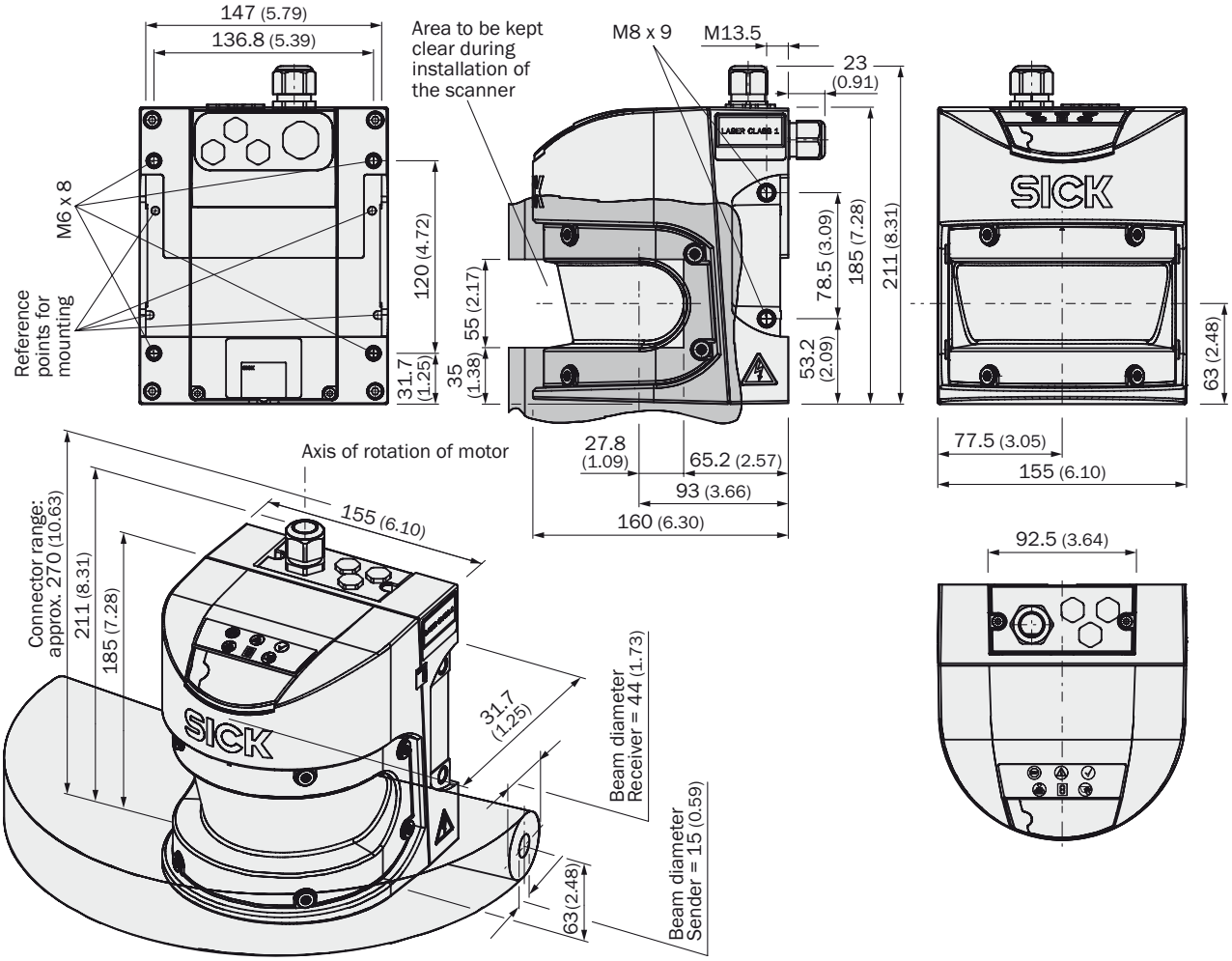


① Mirror axis of rotation
② Scan plane
③ Required viewing slit

S300 Mini Standard



S3000 Standard



Accessories required for commissioning

The following accessories are required for commissioning but not included in the delivered safety system.

Description	Number	Usage	deTec4 Core	deTem4 Core	microScan3 Core I/O	S300 Mini Standard	S3000 Standard
Connecting cable, female connector, M12, 5-pin, flying leads	2	For connecting deTec4 Core or deTem4 Core with Flexi Classic	●	●	–	–	–
Connecting cable, female connector, M12, 8-pin, flying leads	1	For connecting microScan3 Core I/O or S300 Mini Standard with Flexi Classic	–	–	●	●	–
System plug S3000 Standard with connecting cable, flying leads	1	For connecting S3000 Standard with Flexi Classic	–	–	–	–	●
Connection cable, USB-A, Mini-USB	1	For configuration of microScan3 Core I/O	–	–	●	–	–
Connection cable, USB-A, male connector, M8, 4-polig	1	For configuration of S300 Mini Standard or S3000 Standard	–	–	–	●	●

Accessories

Mounting systems

Mounting brackets

Figure	Description	Packing unit	Type	Part no.					
	Mounting bracket with protection of optics hood	1 piece	Mounting kit 1b	2074242	–	–	●	–	
	Mounting bracket for rear mounting on wall or machine with protection of optics hood	1 piece	Mounting kit 1b	2034325	–	–	–	●	–
	Mounting bracket for direct mounting, from the rear, on wall or machine, not adjustable	1 piece	Mounting kit 1	2015623	–	–		–	●
	Mounting bracket for rear mounting on wall or machine, adjustable longitudinal and lateral axes, only in conjunction with Mounting kit 1 (2015623)	1 piece	Mounting kit 2	2015624	–	–	–	–	●

Connection systems

Connecting cables

Figure	Connection type		Conductor cross-section	Model	Length of cable	Type	Part no.	deTec4 Core	deTem4 Core	microScan3 Core I/O	S300 Mini Standard	S3000 Standard
	Female connector, M12, 5-pin, straight	Flying leads	0.34 mm²	PUR, halogen-free, unshielded	2 m	YF2A15-020UB5XLEAX	2095617	●	●	–	–	–
					5 m	YF2A15-050UB5XLEAX	2095618	●	●	–	–	–
					10 m	YF2A15-100UB5XLEAX	2095619	●	●	–	–	–
	Female connector, M12, 8-pin, straight	Flying leads	0.25 mm²	PUR, halogen-free, unshielded	5 m	DOL-1208G05MD25KM1	2079315	–	–	●	–	–
					10 m	DOL-1208G10MD25KM1	2079316	–	–	●	–	–
				PUR, halogen-free, shielded	5 m	DOL-127SG05ME25KM0	2076541	–	–	–	●	–
					10 m	DOL-127SG10ME25KM0	2076543	–	–	–	●	–
					15 m	DOL-127SG15ME25KM0	2076544	–	–	–	●	–

System plug with connecting cable

- **Model:** Pre-assembled, not for use of incremental encoders, integrated configuration storage, PVC, unshielded
- **Items supplied:** With 1 x cable gland M20, 1 x blanking plug M20, 2 x blanking plug M12

Figure	Connection type	Number of cores	Length of cable	Specialty	Type	Part no.					
	Flying leads	9-wire	5 m	Cable connection at the rear	SX0A-B0905G	2049222	–	–	–	–	●
			10 m	Cable connection at the top	SX0A-B0910B	2027171	–	–	–	–	●
			20 m		SX0A-B0920B	2027814	–	–	–	–	●

Connection cables

Figure	Connection type		Length of cable	Type	Part no.					
	USB-A	Mini-USB	3 m	Connection cable (male connector-male connector)	6042517	–	–	●	–	–
	USB-A	Male connector, M8, 4-pin, straight	2 m	DSL-8U04G02M025KM1	6034574	–	–	–	●	●
			10 m	DSL-8U04G10M025KM1	6034575	–	–	–	●	●

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Additional components required

The additionally needed components are not included in the scope of delivery. Further information on the requirements for the additionally needed components can be found in the operating instructions. Download ➜ www.sick.com

Relay module	✔
Emergency stop pushbutton	✔ [1]
Reset pushbutton	✔

[1] At least two emergency stop devices must be installed, e.g., emergency stop pushbuttons. Depending on the risk assessment, it may be necessary to install additional emergency stop pushbuttons.

➜ Suitable devices from SICK can be found in the following tables

Flexi Classic relay modules

Figure	Suitable for	Number of enable current contacts	Number of signalling current contacts	Number of contactor monitoring contacts	Type	Part no.
	Manual robot restart	2	1	1	UE410-2RO4	6032677
	Automatic robot restart	4	2	2	UE410-4RO4	6032676

Emergency stop pushbuttons and reset pushbuttons

Figure	Product family	Description	Connection type	Type	Part no.
	ES21	Emergency stop pushbutton	Cable gland, 2 x M20	ES21-SA10E1	6036147
				ES21-SB10E1	6041507
	ES11	Emergency stop pushbutton	Male connector, M12, 4-pin	ES11-SA1A4	6051327
		Emergency stop pushbutton with reset pushbutton	Male connector, M12, 8-pin	ES11-SC4D8	6051329
	ER12	Reset pushbutton	Male connector, M12, 4-pin	ER12-SB3C4	6051330

Accessories for emergency stop pushbuttons and reset pushbuttons

Figure	Connection type		Conductor cross-section	Length of cable	Type	Part no.	ES11-SA1A4	ES11-SC4D8	ER12-SB3C4
	Female connector, M12, 4-pin, straight	Flying leads	0,34 mm²	10 m	YF2A14-100VB3XLEAX	2096236	●	–	●
				15 m	YF2A14-150VB3XLEAX	2096237	●	–	●
	Female connector, M12, 8-pin, straight	Flying leads	0,25 mm²	10 m	YF2A18-100UA5XLEAX	2095654	–	●	–
				15 m	YF2A18-150UA5XLEAX	2095679	–	●	–

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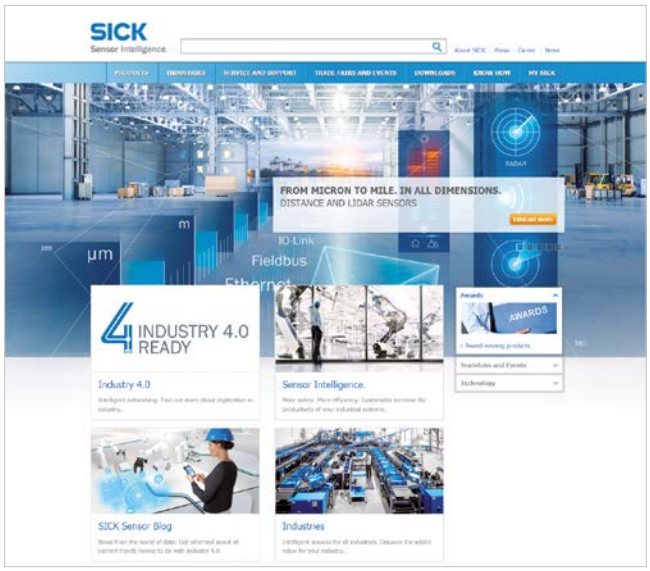

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