

# Safe Robotics Area Protection

OPEN ACCESS FOR SAFE PRODUCTIVITY

Safety systems

**SICK**  
Sensor Intelligence.

# SAFE PRODUCTIVITY FOR ROBOTICS APPLICATIONS

With many years of experience in the field of industrial safety and the automation and safeguarding of robot applications, SICK knows the challenges its customers face very well. To keep both safety and productivity at the highest possible level, SICK is offering safety systems, such as *Safe Robotics Area Protection*, which serve as the basis for quick and easy safeguarding of freely-accessible robot applications. The focus is on close and, at the same time, safe interaction between humans and robots. The result: High productivity as well as increased efficiency and improved ergonomics in robot applications.

## SAFETY SYSTEMS FROM SICK: EVERYTHING FROM A SINGLE SOURCE

*Safe Robotics Area Protection* offers your workers safe access to hazardous robot areas. The special feature: The safety logic is ideally aligned to the robot system used, thereby ensuring optimal operation of your application. The integration of the safety systems is very simple, since all required components for user-friendly and time-saving commissioning come from SICK. In addition, you can easily adapt the safeguarded areas to the requirements of the respective production steps, thereby optimizing work processes.

### Hardware

Pre-selected and proven safety hardware components



- + Optimal protection for freely-accessible robot applications

### Logic

Logic with safe and non-safe functions tested and confirmed by safety experts



- + Available as software for the *Flexi Soft* safety controller or as configuration logic for *Flexi Classic*

### Documentation

Detailed documentation with SISTEMA file, wiring diagram, safety laser scanner configuration file and operating instructions



- + Easy integration into the robot controller



*Safe Robotics Area Protection* is available in different variants which vary based on their principle of operation.

### sBot Speed

#### Unspecific variants

- sBot Speed

#### Manufacturer-specific variants

- sBot Speed – UR (Universal Robots)
- sBot Speed – YA (Yaskawa)

→ [page 4](#)

#### Manufacturer-specific variants with presence detection

- sBot Speed CIP – FA (FANUC)

→ [page 6](#)

### sBot Stop

#### Unspecific variants

- sBot Stop

→ [page 8](#)

A **selection guide** for the right safety system can be found on

→ [page 10](#)

### + Aim for high productivity



Prevent unnecessary machine downtime and benefit from the option of automatic restart.

### + Guarantee safety



Take advantage of unrestricted and safe access to the hazardous area of the robot at all times. Integration into the robot controller was tested and optimized by SICK.

### + Future-proof investment



Stay flexible! You can adapt *Safe Robotics Area Protection* to your individual requirements, extend it with modules and therefore be prepared for changing requirements and future challenges. All safety systems come from a single source: From SICK, the expert in the field of industrial safety.

### + Save time and money



Save time and money for integration into your robot controller with pre-selected safety hardware components, a safe, ready-made and tested functional logic as well as detailed documentation including a wiring diagram and operating instructions.

# sBot Speed

## WITH SPEED REDUCTION FOR FEWER DOWNTIMES

The *sBot Speed* system variants ensure safety and flexibility because they intelligently combine 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 developed and tested, meaning that the *sBot Speed* is easy to integrate into the most common robot controllers. The safety systems adapt robot operation to the respective position of the worker. This increases productivity, as downtimes are reduced and workflows optimized.



Easy to expand:  
Implement additional safety  
functions into the safety controller  
at any time.



Flexible safety system:  
Optimally adapt the fields of  
the safety laser scanner to the  
application environment.

### sBot Speed is available in different variants:

**A. As unspecific variants  
with *S300 Mini Remote* or  
*microScan3 Core* safety laser  
scanners for the most common  
robot controllers**

**B. As variants optimally aligned  
to the UR3, UR5 and UR10  
Universal Robots models with  
the *S300 Mini Remote* safety  
laser scanner**

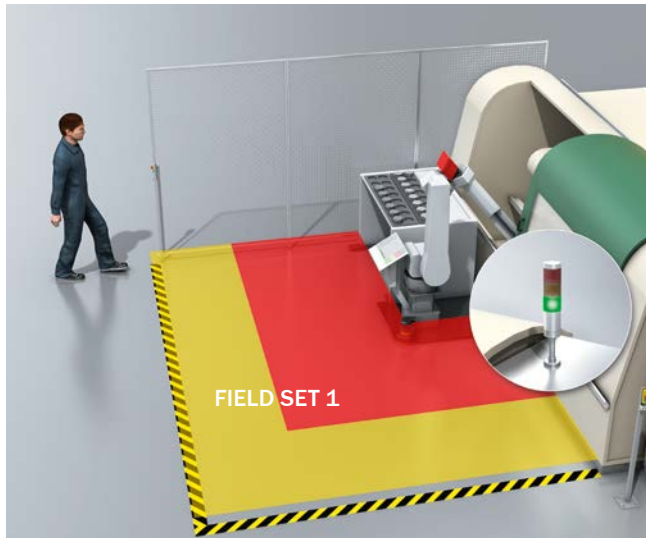
- Consideration of the two operating modes “Running mode” and “Programming mode” in order to enable the operating staff to program the robot
- Description of the additional safety components required to comply with safety standards, e.g. reset pushbutton and operating mode selector switch
- All necessary robot-specific parameter settings, wiring diagram and SISTEMA file are contained in the detailed documentation and ensure quick commissioning

**C. As variants optimally aligned to the  
DX200, YRC1000 and YRC1000micro  
Yaskawa robot controllers with  
the *microScan3 Core* safety laser  
scanner**

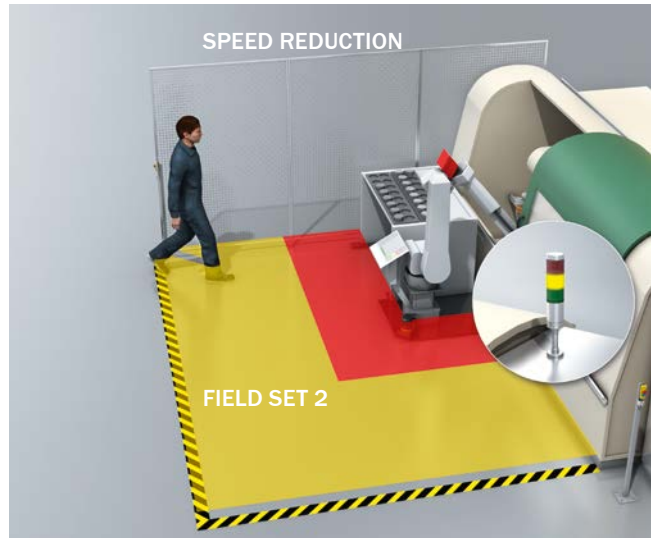
- Consideration of the two operating modes “Running mode” and “Programming mode” in order to enable the operating staff to program the robot
- All necessary robot-specific parameter settings, wiring diagram and SISTEMA file are contained in the detailed documentation and ensure quick commissioning



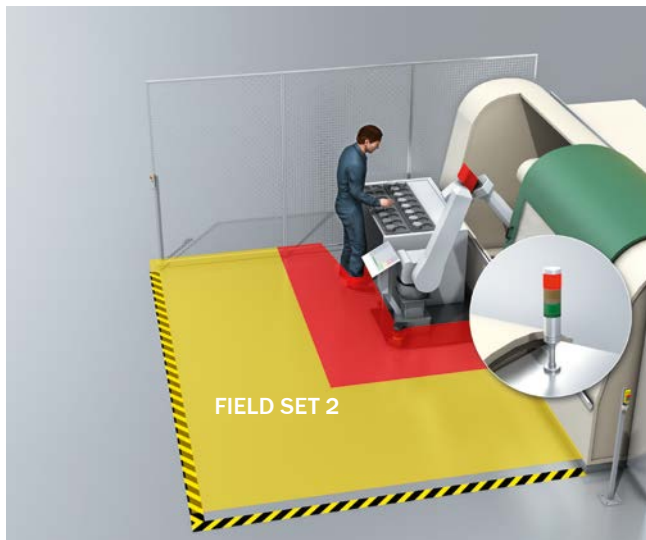
## PRINCIPLE OF OPERATION BASED ON A CNC MACHINE



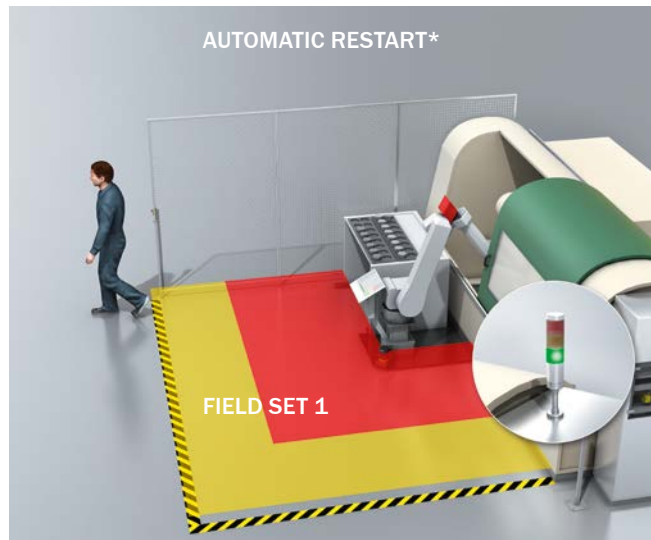
- 1** With *sBot Speed*, the safety laser scanner uses two different field sets which consist of a warning field (yellow) and a protective field (red). The minimum distance of each protective field must be defined based on the robot speed.



- 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 is smaller than that of field set 1.



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



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

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

# sBot Speed CIP – FA

## MORE OPTIONS FOR CHALLENGING ROBOT APPLICATIONS

*sBot Speed CIP – FA* combines the *microScan3 Core – EFI-pro* safety laser scanner with the *Flexi Soft* safety controller and the *EFI-pro* gateway. The system variant is optimally aligned to the FANUC R-30iB Plus robot controller based on EtherNet/IP™ CIP Safety™. In addition to the general advantages of the *sBot Speed* the *sBot Speed CIP – FA* offers other benefits oriented specifically to the use of FANUC robots. Thanks to safe simultaneous field monitoring, this safety system is also suitable for freely-accessible robot applications in which persons can walk behind the safeguarded area, for example in palletizer systems. The communication between the safety system and FANUC robot controller can be set easily thanks to the pre-configured parameters. In addition, the CIP Safety™ safety interface also minimizes wiring effort, since only one cable is enough to connect to the robot controller.



EtherNet/IP™ CIP Safety™:  
Profit from optimal robot  
integration and the option of  
setting additional functions.



Easy to extend:  
Integrate other SICK components  
into the safety system in the blink  
of an eye.

### CIP Safety™

Integration of the safety system into the robot controller is safe and easy and is done directly via EtherNet/IP™ CIP Safety™. *Flexi Soft* works as the originator and triggers the safety functions in the robot controller.



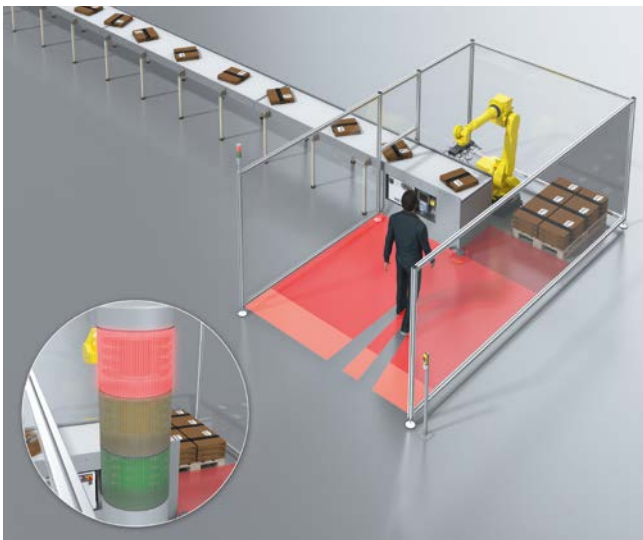
## PRINCIPLE OF OPERATION USING THE EXAMPLE OF A PALLETIZER SYSTEM



- 1** The sBot Speed CIP – FA works with various protective fields of the microScan3 Core – EFI-pro safety laser scanner which are simultaneously monitored. The minimum distance of each protective field is defined based on the robot speed.



- 2** If a worker enters protective field 1, the safety controller initiates a reduction of the robot speed.



- 3** The robot does not stop until the person enters the second defined protective field and therefore comes too close to the hazardous area.



- 4** As soon as the person leaves protective field 1, the robot automatically restarts after successful testing of the safe sequence monitoring\*. Manual restart of the robot is only required if the person does not correctly follow the expected exit sequence or enters protective field 3.

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

# sBot Stop

## THE COMPACT SOLUTION FOR A SAFE STOP

sBot Stop combines the functions of a safety light curtain or a multiple light beam safety device for access monitoring, of a safety laser scanner for presence detection and of the non-programmable *Flexi Classic* safety controller in an intelligent manner. Thanks to the vertical protection and the short response time of the safety light curtain or the multiple light beam safety device, the safety system enables a compact machine design with minimal safety distance to the hazardous area. 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.



+ Save time thanks to easy configuration via rotary switch.



+ Take advantage of the benefits of a compact machine design thanks to vertical safeguarding and short response times.

sBot Stop is available in 11 variants with the following single components:

- Safety light curtain or multiple light beam safety device
- Safety laser scanner
- Non-programmable safety controller
- Documentation
  - Wiring diagram
  - SISTEMA file
  - Operating instructions

### Examples



sBot Stop with S300 Mini Standard



sBot Stop with microScan3 Core



sBot Stop with S3000 Standard



All variants of the sBot Stop can be found on → [page 24](#)



## PRINCIPLE OF OPERATION BASED ON A CNC MACHINE



- 1** *sBot Stop* is characterized by two protective devices: A safety light curtain or a multiple light beam safety device is used as the primary protective device for access control for the robot application, a safety laser scanner is used as the secondary protective device for presence detection.



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



- 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 can only reset after the worker has left the hazardous area.

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

## SELECTION GUIDE

System variants	Robot type				Robot stopping process		Robot restart		Interface with the robot controller	
	Unspecific	Universal Robots	Yaskawa	FANUC	With previous speed reduction	Immediate stop	Automatic	Manual	Discrete I/Os	Ethernet/IP™ CIP Safety™
sBot Speed	■				■		■		■	
sBot Speed – UR		■			■		■		■	
sBot Speed – YA			■		■		■		■	
sBot Speed CIP – FA				■	■		■	■ <sup>1)</sup>		■
sBot Stop	■					■	■ <sup>2)</sup>	■ <sup>2)</sup>	■	

<sup>1)</sup> With the third protective field.

<sup>2)</sup> According to variant.

## FIELDS OF APPLICATION

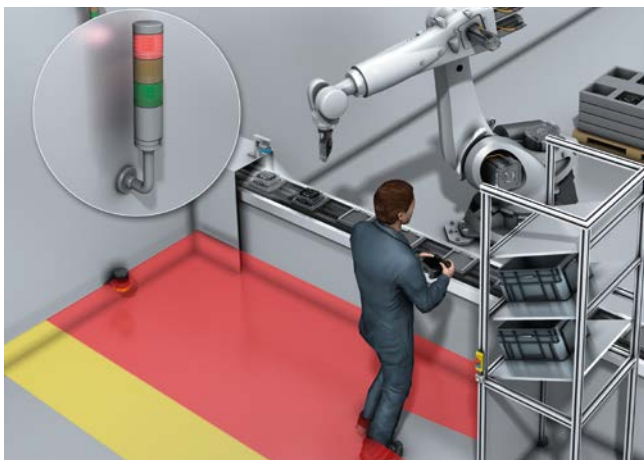
The area of application of the *Safe Robotics Area Protection* safety systems is constantly growing as robot applications are now nearly indispensable as supplements and support for work processes in most branches of industry.



### Automotive and parts suppliers

E.g. in the production of electric engines

	Included opto-electronic protective devices		Type of safety controller		Features of the safety system			Parts for order				Page
	Safety laser scanner	Safety light curtain or multiple light beam safety device	Programmable Flexi Soft safety controller	Non-programmable Flexi Classic safety controller	Flexibility	Presence detection	Low space requirement	Hardware	Software package	Hardware and logic	Hardware and software	
	■		■		■						■	→ 13
	■		■		■						■	→ 13
	■		■		■			■	■			→ 13
	■		■		■	■		■	■			→ 19
	■	■		■			■			■		→ 24



## Electronics and solar

E.g. in quality control work stations



## Consumer goods

E.g. in packaging stations

## OPEN ACCESS FOR SAFE PRODUCTIVITY



### Product description

The Safe Robotics Area Protection safety systems from SICK are a starting point for safe human-robot interaction and enable cooperative and freely-accessible robot applications. The systems feature a tested functional logic which can be combined with safety sensors from SICK. Safe Robotics Area Protection is also available as manufacturer-specific variants, e.g. for Universal

Robots, FANUC and Yaskawa. Thanks to the detailed documentation and robot-specific settings, these variants can be easily integrated into robot controls. The safety systems comply with international safety standards and enable an increase in productivity thanks to less downtime and optimized work processes.

### At a glance

- Safety systems consist of hardware and functional logic
- Safety functions thanks to tested functional logic
- Generic or manufacturer-specific variants for Universal Robots, FANUC and Yaskawa
- Documentation also includes wiring diagram, SISTEMA file and operating instructions
- Automatic robot restart possible
- PL d

### Your benefits

- Free, safe access to cooperative robot applications for high productivity, less downtime, 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 adapted
- Detailed documentation for robot integration, compliant with relevant standards
- Low costs as the system is easy to integrate into industrial robot controllers, thanks to generic or manufacturer-specific variants for Universal Robots, FANUC and Yaskawa
- Reliable safety for your plant – proven functional logic, developed by SICK experts

### Additional information

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→ [www.sick.com/Safe\\_Robotics\\_Area\\_Protection](http://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.



## sBot Speed, sBot Speed – UR, sBot Speed – YA

### Detailed technical data

	sBot Speed	sBot Speed – UR	sBot Speed – YA
<b>Robot controller</b>	Generic	Universal Robots: CB 3.0 oder CB 3.1	Yaskawa: DX200, YRC1000, YRC1000micro
<b>Safety task</b>	Hazardous area protection		
<b>Stopping process of the robot</b>	With speed reduction		
<b>Robot restart</b>	Automatic		
<b>Performance level</b>	PL d (ISO 13849-1)		
<b>Supply voltage V<sub>s</sub></b>	24 V DC (16.8 V DC ... 28.8 V DC)		
<b>Ambient operating temperature</b>	–10 °C ... +50 °C		
<b>Storage temperature</b>	–20 °C ... +50 °C		
<b>Air humidity</b>	90% at 50 °C (EN 61131-2)		
<b>Safe state in the event of a fault</b>	The safety-related semiconductor outputs are in the OFF state.		
<b>Safety laser scanner</b>	microScan3 Core I/O / S300 Mini Remote (depending on type)	S300 Mini Remote	microScan3 Core I/O
Protective field range	5.5 m / 3 m (depending on type)	3 m	5.5 m
<b>Safety controller included</b>	Flexi Soft		
Safety controller type	Programmable		
<b>Interface</b>	Discrete I/Os		

### Functions

	sBot Speed	sBot Speed – UR	sBot Speed – YA
<b>Emergency stop</b>			
Shut down in the event of an emergency situation	✓		
Prevent unexpected restarting after an emergency stop	✓		
<b>Initiate a safety stop</b>			
Automated reset	✓		
<b>Safety-rated monitored speed</b>			
Trigger safety-rated monitored speed	✓		
Switch field sets	✓		
<b>Operating mode</b>			
Operating mode selection	–	✓	–
Enabling device - manual operating mode	–	✓	–
Operating mode selection (implemented in robot control)	–		✓
Enabling device - manual operating mode (implemented in robot control)	–		✓



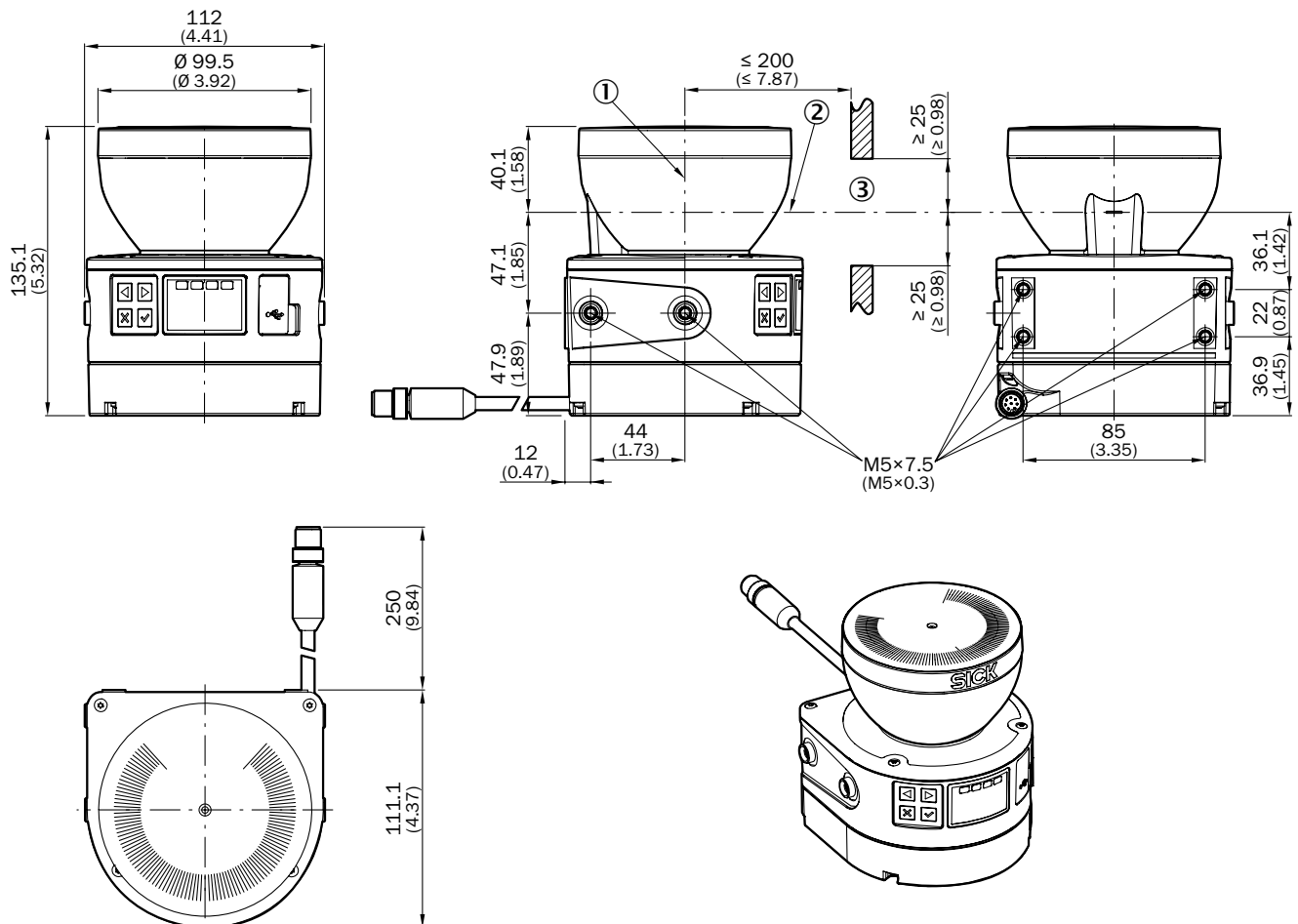
## Ordering information

Variant	Robot controller	Safety controller included	Safety laser scanner included	Protective field range	Product type	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 UE410-4R04	microScan3 Core I/O	5.5 m	Hardware, Software	SAPPB2D-08X0039	1093376
			S300 Mini Remote	3 m	Hardware, Software	SAPPB2D-08X0040	1093377
sBot Speed – UR	Universal Robots: CB 3.0 or CB 3.1	Flexi Soft: 1 x system plug MPL0 1 x main module CPU1 3 x I/O module XTIO	S300 Mini Remote	3 m	Hardware, Software	SAPPB2D-08X0041	1096129
sBot Speed – YA	Yaskawa: DX200, YRC1000, YRC1000micro	–	–	–	Software	SAPPB2D-08XS006	1614202
sBot Speed – YA	Yaskawa: DX200, YRC1000, YRC1000micro	Flexi Soft: 1 x system plug MPL0 1 x main module CPU1 2 x I/O module XTIO 2 x relay module UE410-4R04	microScan3 Core I/O	5.5 m	Hardware	Hardware Kit	1106014

**Please note:** Hardware and software have to be ordered for the sBot Speed – YA.

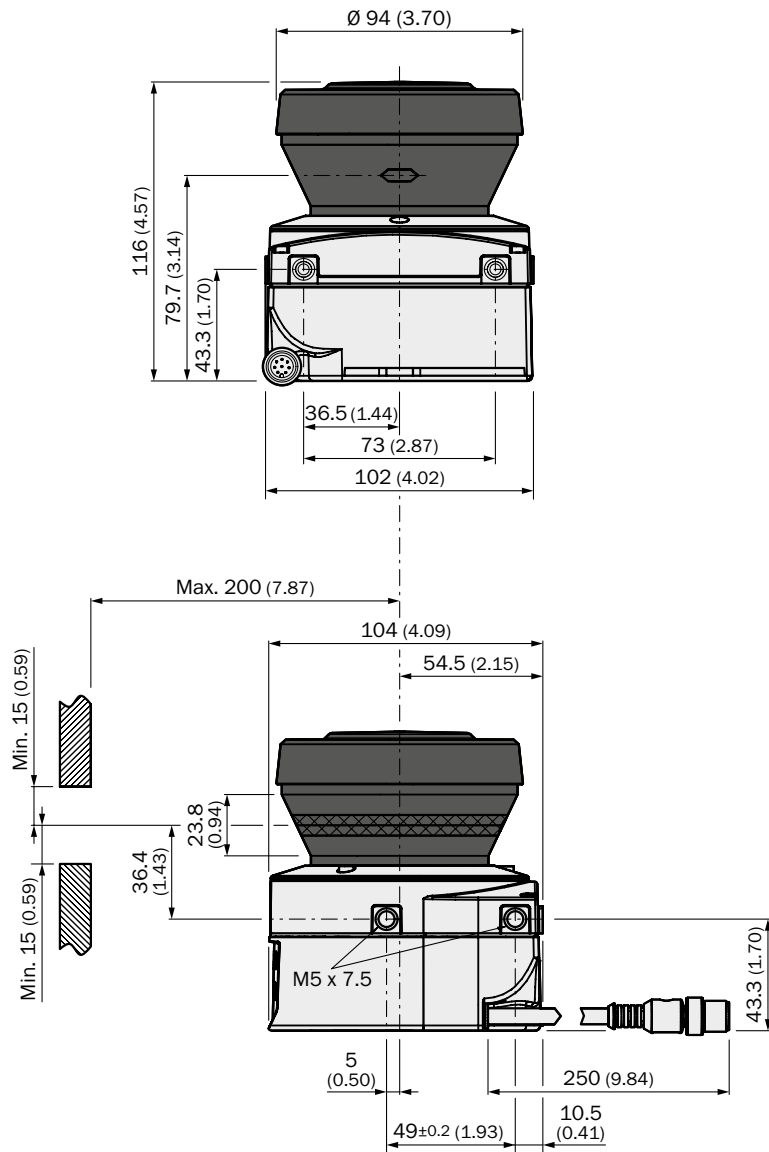
## Dimensional drawings (Dimensions in mm (inch))

microScan3 Core I/O



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

## 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.			
	Male connector, USB-A, straight	Male connector, Mini-USB, straight	3 m	Connection cable (male connector-male connector)	6042517	●	-	-
	Male connector, M8, 4-pin, straight	Male connector, USB-A, 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](http://www.sick.com)



	sBot Speed	sBot Speed – UR	sBot Speed – YA
<b>Emergency stop pushbutton</b>	✓ <sup>1)</sup> → Suitable emergency stop pushbuttons from SICK can be found in the following table		
<b>Reset pushbutton</b>	✓ → Suitable reset pushbuttons from SICK can be found in the following table		
<b>Operating mode selector switch</b>	✓ (has to be integrated in the robot pendant or in the robot controller)	✓ (external device required)	Is integrated into the robot pendant or must be integrated into the robot controller
<b>Three-position enabling device</b>	✓ (has to be integrated in the robot pendant)	✓ (external device required)	Is integrated into the robot pendant or must be integrated into the robot controller

<sup>1)</sup> 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-SB10G1	6036492
	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 mm <sup>2</sup>	10 m	YF2A14-100VB3XLEAX	2096236	●	-	●
				15 m	YF2A14-150VB3XLEAX	2096237	●	-	●
	Female connector, M12, 8-pin, straight	Flying leads	0,25 mm <sup>2</sup>	10 m	YF2A18-100UA5XLEAX	2095654	-	●	-
				15 m	YF2A18-150UA5XLEAX	2095679	-	●	-



## sBot Speed CIP – FA

### Detailed technical data

<b>Robot controller</b>	FANUC: R-30iB Plus
<b>Safety task</b>	Hazardous area protection
<b>Stopping process of the robot</b>	With speed reduction
<b>Robot restart</b>	Automatic
<b>Performance level</b>	PL d (ISO 13849-1)
<b>Supply voltage V<sub>s</sub></b>	24 V DC (16.8 V DC ... 30 V DC)
<b>Ambient operating temperature</b>	-10 °C ... +50 °C
<b>Storage temperature</b>	-25 °C ... +70 °C
<b>Air humidity</b>	90% at 50 °C (EN 61131-2)
<b>Safe state in the event of a fault</b>	The safety outputs via the network are logic 0.
<b>Safety laser scanner</b>	microScan3 Core – EFI-pro
Protective field range	5.5 m
<b>Safety controller included</b>	Flexi Soft
Safety controller type	Programmable
<b>Interface</b>	EtherNet/IP™ CIP Safety™

### Functions

<b>Emergency stop</b>	
Shut down in the event of an emergency situation	✓
Prevent unexpected restarting after an emergency stop	✓
<b>Initiate a safety stop</b>	
Automated reset and restart with safe sequence monitoring	✓
Optional manual reset	✓
<b>Safety-rated monitored speed</b>	
Trigger safety-rated monitored speed	✓
<b>Operating mode</b>	
Operating mode selection (implemented in robot control)	✓
Enabling device - manual operating mode (implemented in robot control)	✓

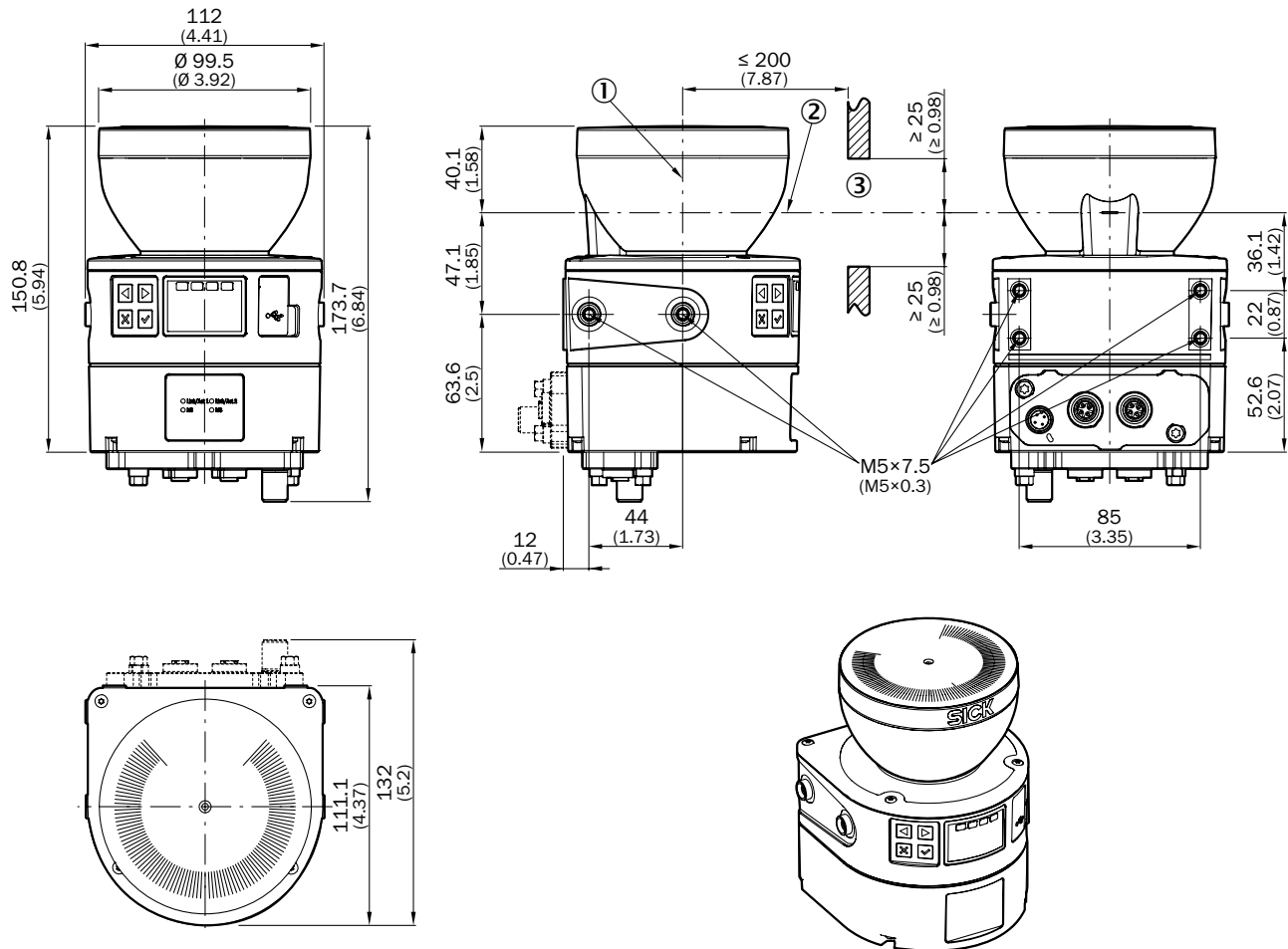
### Ordering information

Variant	Robot type	Safety controller included	Safety laser scanner included	Protective field range	Product type	Type	Part no.
sBot Speed CIP – FA	FANUC: R-30iB Plus	Flexi Soft: 1 x system plug MPL0 1 x main module CPU0 1 x I/O module XTIO 1 x Gateway-Modul FX3-GEPRO	microScan3 Core – EFI-pro	5.5 m	Hardware	Hardware Kit	1105347
–	–	–	–	–	Software	SAPPC2D-08XS002	1614143

**Please note:** Hardware and software have to be ordered for the sBot Speed CIP.

### Dimensional drawings (Dimensions in mm (inch))

microScan3 Core – EFI-pro



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

## Accessories required for commissioning

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


Description	Number	Usage
Connecting cable, female connector, M12, 4-pin, flying leads	1	To supply voltage to the microScan3 Core – EFI-pro
Connection cable, USB-A, Mini-USB	1	For configuration of microScan3 Core – EFI-pro
Connection cable, male connector, M12, 4-pin, mail connector, RJ-45, 8-pin	1 – 2 <sup>1)</sup>	For connecting microScan3 Core – EFI-pro with Flexi Soft Gateway or/and robot controller

<sup>1)</sup> Dependent on the network structure

## 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




### Connection systems

#### Connecting cables

- **Model:** PUR, halogen-free, unshielded

Figure	Connection type		Conductor cross-section	Length of cable	Type	Part no.
	Female connector, M12, 4-pin, angled	Flying leads	0,75 mm <sup>2</sup>	5 m	DOL-1204W05MC75KM0	2079294
				10 m	DOL-1204W10MC75KM0	2079295
				20 m	DOL-1204W20MC75KM0	2089704
	Female connector, M12, 4-pin, straight	Flying leads	0,75 mm <sup>2</sup>	5 m	DOL-1204G05MC75KM0	2079291
				10 m	DOL-1204G10MC75KM0	2079292
				20 m	DOL-1204G20MC75KM0	2089703

#### Connection cables

Figure	Connection type		Model	Length of cable	Type	Part no.
	Male connector, M12, 4-pin, straight	Male connector, RJ45, 8-pin, straight	PUR, halogen-free, shielded	2 m	SSL-2J04-G02ME60	6047916
				5 m	SSL-2J04-G05ME60	6047917
				10 m	SSL-2J04-G10ME60	6047918
				20 m	SSL-2J04-G20ME60	6063700
	Male connector, M12, 4-pin, angled	Male connector, RJ45, 8-pin, straight	PUR, halogen-free, shielded	2 m	SSL-2J04-H02ME	6047911
				5 m	SSL-2J04-H05ME	6045287
				10 m	SSL-2J04-H10ME	6045288
				20 m	SSL-2J04-H20ME	6063701
	Male connector, USB-A, straight	Male connector, Mini-USB, straight	Shielded	3 m	Connection cable (male connector-male connector)	6042517






## 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](http://www.sick.com)



	sBot Speed – FA
<b>Emergency stop pushbutton</b>	✓ <sup>1)</sup> → Suitable emergency stop pushbuttons from SICK can be found in the following table
<b>Reset pushbutton</b>	✓ → Suitable reset pushbuttons from SICK can be found in the following table
<b>Operating mode selector switch</b>	✓ Is integrated into the robot pendant or must be integrated into the robot controller
<b>Three-position enabling device</b>	✓ Is integrated into the robot pendant or must be integrated into the robot controller

<sup>1)</sup> 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-SB10G1	6036492
	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 mm <sup>2</sup>	10 m	YF2A14-100VB3XLEAX	2096236	●	-	●
				15 m	YF2A14-150VB3XLEAX	2096237	●	-	●
	Female connector, M12, 8-pin, straight	Flying leads	0,25 mm <sup>2</sup>	10 m	YF2A18-100UA5XLEAX	2095654	-	●	-
				15 m	YF2A18-150UA5XLEAX	2095679	-	●	-



## sBot Stop

### Detailed technical data

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

### Functions

<b>Emergency stop</b>	
Shut down in the event of an emergency situation	✓
Prevent unexpected restarting after an emergency stop	✓
<b>Initiate a safety stop</b>	
Automated reset	✓ (depending on type)
Manual reset	✓ (depending on type)

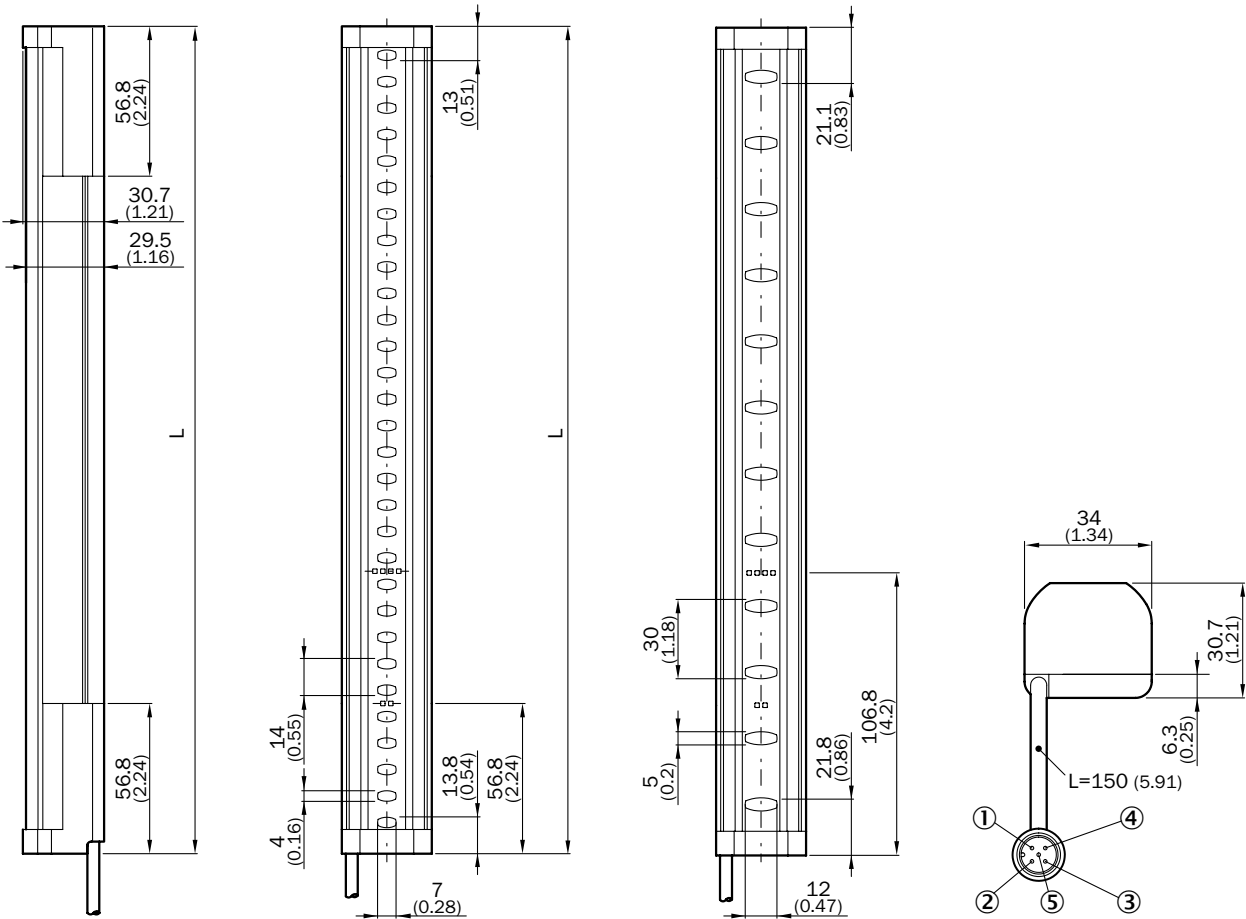
## Ordering information

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 MU4TO 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 MU4TO	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

**Please note:** Each part number includes hardware and logic.

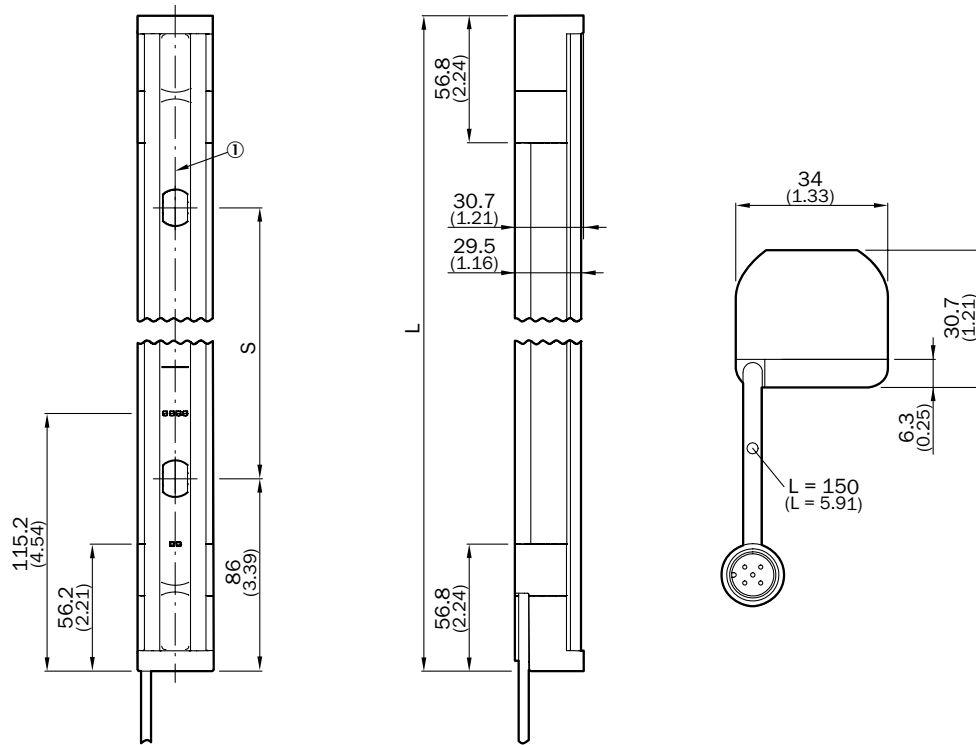
Dimensional drawings (Dimensions in mm (inch))

deTec4 Core



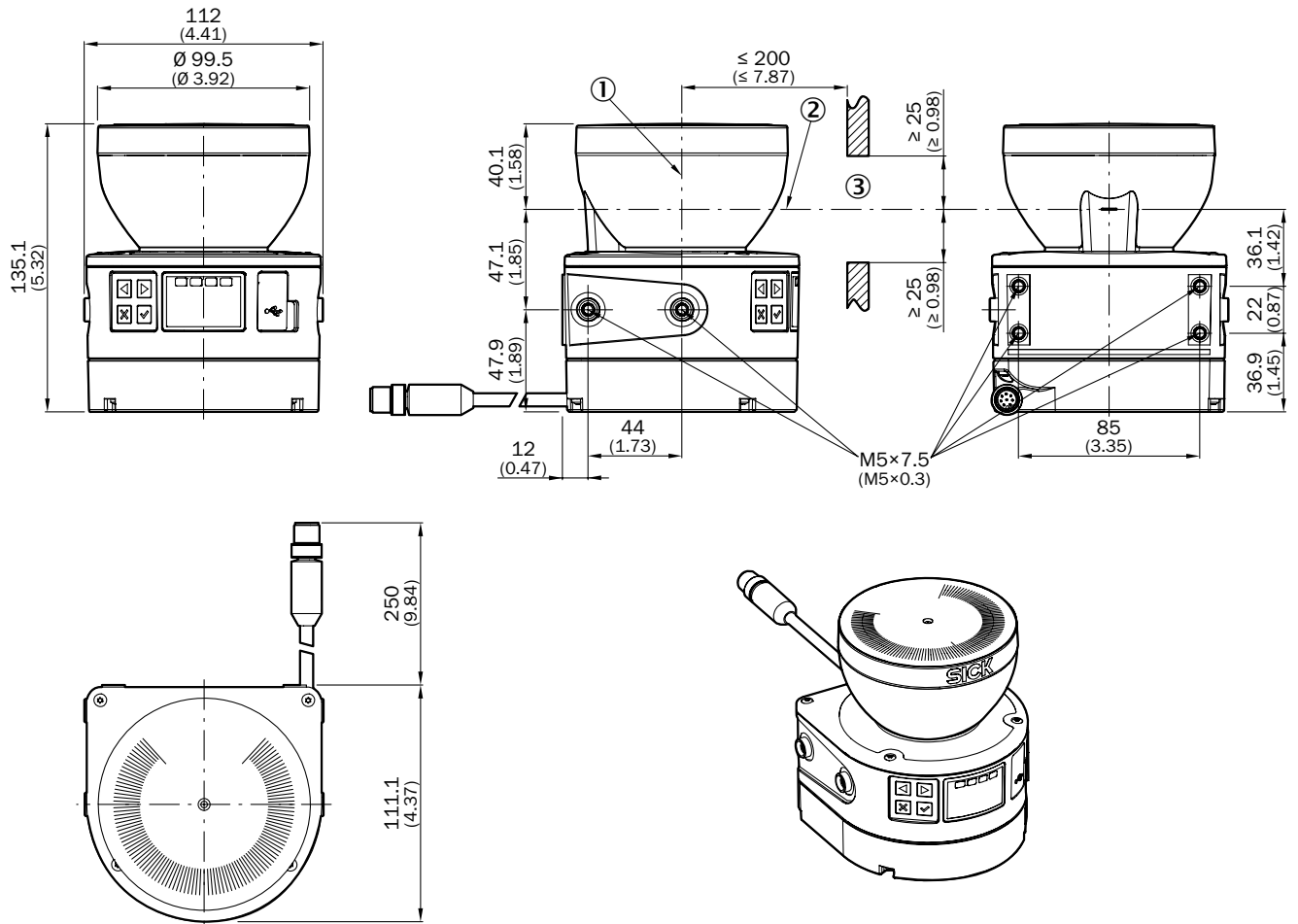
Protective field height	L
1,200 (47.24)	1,213 (47.76)
1,500 (59.06)	1,512 (59.53)

## deTem4 Core



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

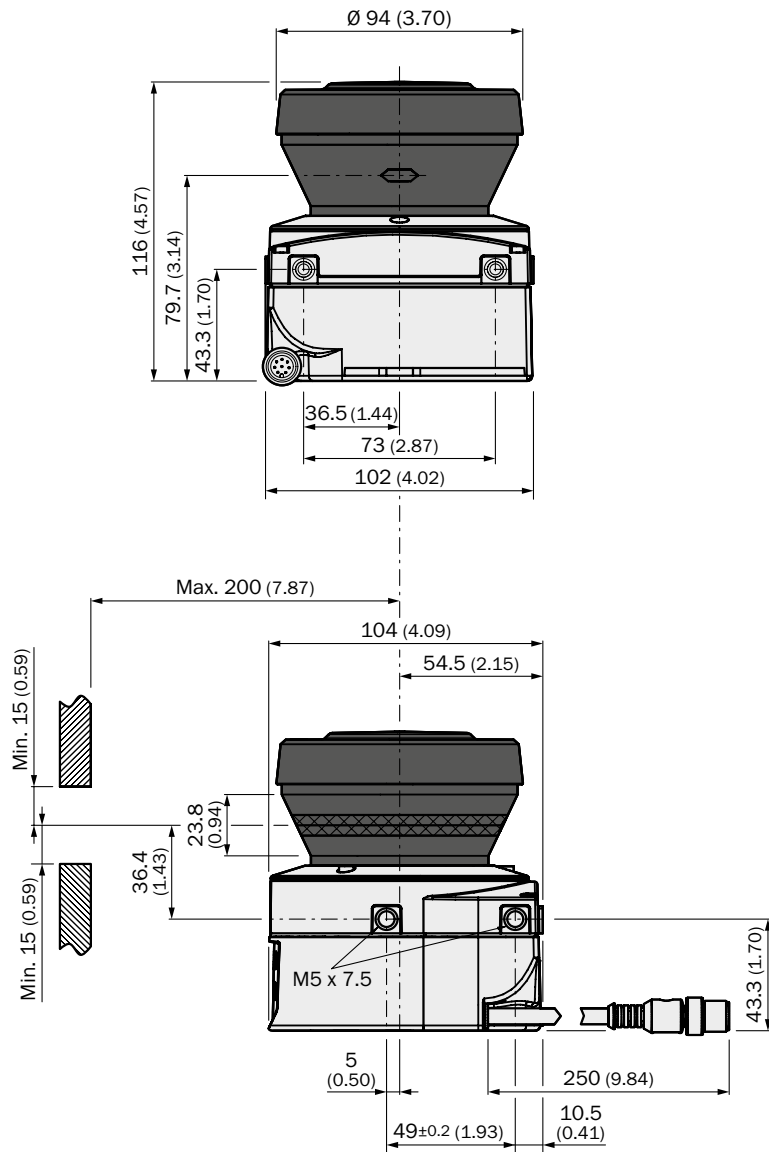
## microScan3 Core I/O



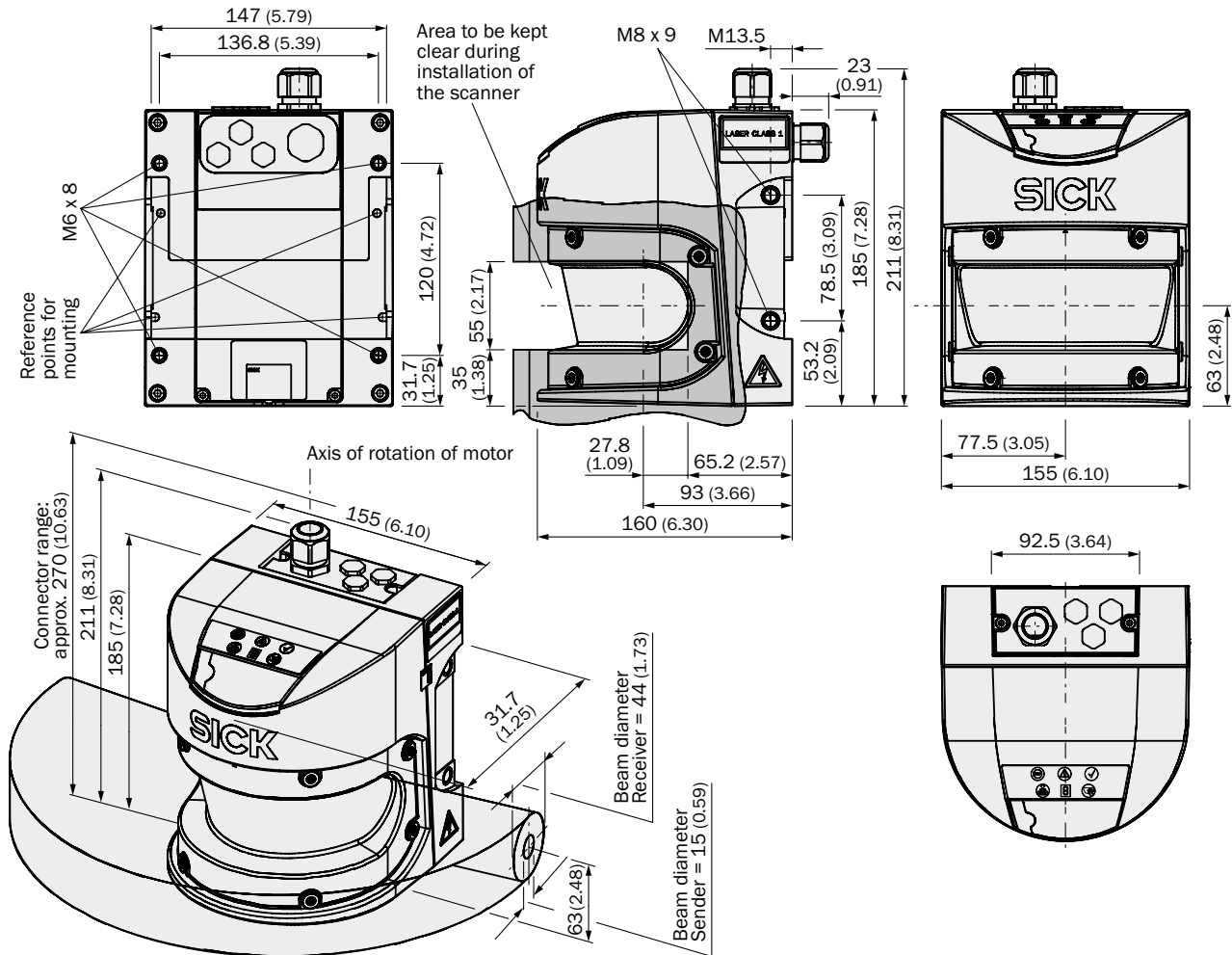
- ① Mirror axis of rotation
- ② Scan plane
- ③ Required viewing slit



## 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 mm <sup>2</sup>	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 mm <sup>2</sup>	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	-	-	-	●	●

### 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](http://www.sick.com)

<b>Relay module</b>	✓
<b>Emergency stop pushbutton</b>	✓ <sup>1)</sup>
<b>Reset pushbutton</b>	✓




<sup>1)</sup> 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	UE410-2R04	6032677
	Automatic robot restart	4	2	2	UE410-4R04	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-SB10G1	6036492
	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 mm <sup>2</sup>	10 m	YF2A14-100VB3XLEAX	2096236	●	-	●
				15 m	YF2A14-150VB3XLEAX	2096237	●	-	●
	Female connector, M12, 8-pin, straight	Flying leads	0,25 mm <sup>2</sup>	10 m	YF2A18-100UA5XLEAX	2095654	-	●	-
				15 m	YF2A18-150UA5XLEAX	2095679	-	●	-

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