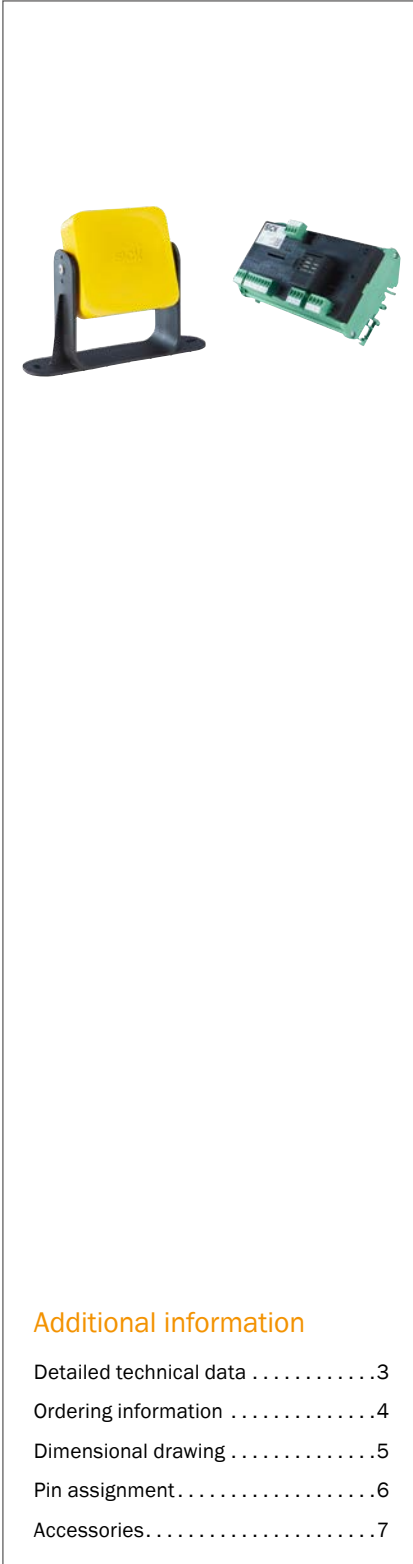# safeRS

SAFE RADAR SYSTEM FOR HAZARDOUS AREA PROTECTION IN RAW ENVIRONMENTS

Safe radar sensors

SICK
Sensor Intelligence.

SAFE RADAR SYSTEM FOR HAZARDOUS AREA PROTECTION IN RAW ENVIRONMENTS

Product description

The safeRS safe radar sensor is an electro-sensitive protective device for safe personal detection with very high machine productivity. It protects stationary applications in accordance with PL d or SIL 2 in line with ISO 13849-1 and IEC 62061. The radar system consists of an evaluation unit and up to 6 sensors which enable switchover to a protected mode as soon as a person enters the protected area. The high resistance to dirt, dust clouds, wood chips, plastic particles and sparks as well as the insensitivity to ambient light such as solar radiation or infrared waves enables reliable operation, even under the toughest ambient conditions. The safeRS stands out due to its rugged sensor housing and quick and easy commissioning.

At a glance

- Evaluation unit and up to 6 sensors
- Protective field: Scanning range up to 4 m, horizontal: 110°, vertical: 30°
- High resilience to dust clouds, wood chips, sparks and plastic particles
- Protection class IP67; operation at −40 °C to +60 °C
- High tolerance against contamination
- Simple configuration using safeRS Designer

Your benefits

- Modular system for adjusting to your protection tasks up to Performance Level d / Category 2 / SIL 2, in accordance with ISO 13849-1 and IEC 62061
- Extended hazardous area protection thanks to three-dimensional protective field
- Very high machine and plant productivity, even under harsh ambient conditions
- Reliable use even at extreme temperatures
- Radar sensors with long cleaning intervals
- Quick and easy commissioning

Additional information

➜ www.sick.com/safeRS

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.

Detailed technical data

More detailed data can be found in the operating instructions. Download ➜ **www.sick.com**

Features

	safeRS sensor	safeRS control
Protective field range	1 m … 4 m	–
Warning field range	1 m … 4 m	–
Field of view		
Large	110° (Horizontal level) 30° (vertical plane)	–
Narrow	50° (Horizontal level) 15° (vertical plane)	–
Response time	≤ 100 ms	

Safety-related parameters

Safety integrity level	SIL2 (IEC 62061)
Category	Category 2 (outputs category 3) (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFH_D (mean probability of a dangerous failure per hour)	4.34 x 10^{-08} [1/h] (EN ISO 13849)
$MTTF_D$ (mean time to dangerous failure)	40 years (IEC 60050)
T_M (mission time)	20 years (EN ISO 13849)
Safe state in the event of a fault	At least one safety relay in OFF state

Functions

Restart interlock	✔
Muting	✔
Manipulation protection	✔
Safe detection of a person	✔

Interfaces

	safeRS sensor	safeRS control
Outputs		
Safety outputs	–	1 relay output, dual-channel
Universal outputs	–	2 relay outputs
Inputs		
Universal inputs	–	3 dual-channel
Test input	–	1
Configuration method	–	PC with safeRS Designer (Configuration and Diagnostic software)
Configuration and diagnostics interface	–	USB 2.0 Micro USB
Display elements	–	LEDs

Electrical data

Supply voltage V_s	24 V DC (20 V DC … 28 V DC)
Power consumption	≤ 0.6 A
Power consumption	11 W (evaluation unit and six sensors)

Mechanical data

	safeRS sensor	safeRS control
Dimensions (W x H x D)	85 mm x 85 mm x 53 mm	166.25 mm x 92.6 mm x 46.5 mm
Housing material	PA 66	–

Ambient data

	safeRS sensor	safeRS control
Enclosure rating	IP67 (IEC 60529)	IP20 (IEC 60529)
Ambient operating temperature	–40 °C ... +60 °C	
Storage temperature	–40 °C ... +80 °C	

Other information

Installation height	0 m ... 3 m
Bandwidth	24 GHz ... 24.25 GHz
Transmissin power	≤ 13 dBm
Radio class	Class 2 (2014/53/EU, RED - radio equipment)
Detection method	FMCW radar for motion detection

Ordering information

Items supplied safeRS sensor:
- safeRS sensor
- Safety instruction
- Mounting instructions
- Operating instructions for download ➜ www.sick.com/safeRS
- safeRS Designer (Configuration and Diagnostic software) for download ➜ www.sick.com/safeRS
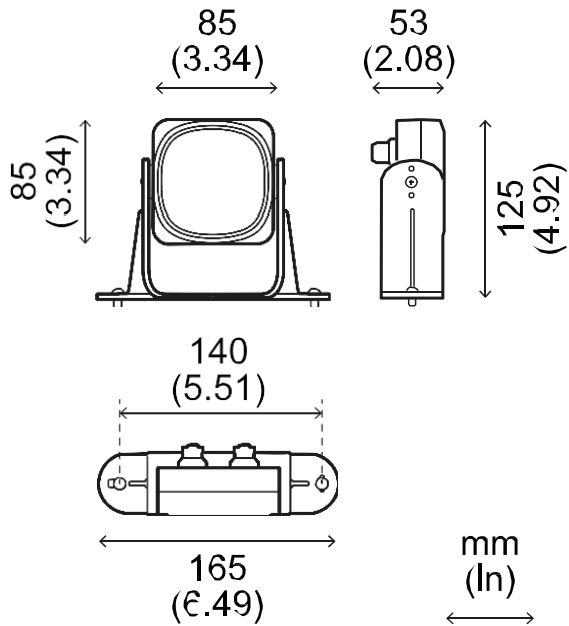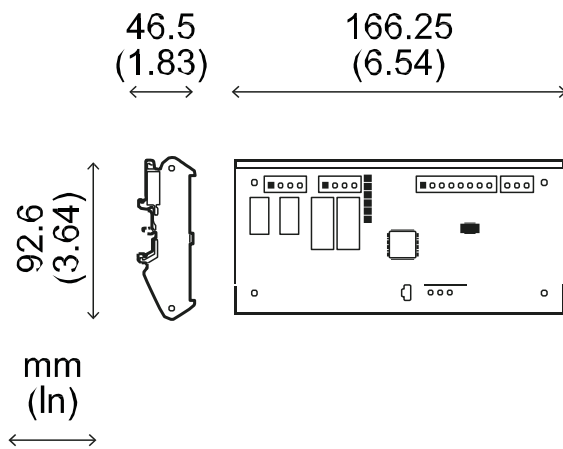
Items supplied safeRS control:
- safeRS control
- Safety instruction
- Mounting instructions
- Operating instructions for download ➜ www.sick.com/safeRS
- safeRS Designer (Configuration and Diagnostic software) for download ➜ www.sick.com/safeRS

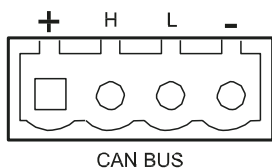| Variant	Integration in the control system	Type	Part no.
safeRS sensor	–	SRA2-AAR140AKZI	6073487
safeRS control	Local inputs and outputs (I/O)	SRA2-AAC140AANI	6073486

Dimensional drawing

safeRS sensor

85
(3.34)

53
(2.08)

85
(3.34)

125
(4.92)

140
(5.51)

165
(6.49)

mm
(In)

safeRS control

46.5
(1.83)

166.25
(6.54)

92.6
(3.64)

mm
(In)

Pin assignment

Sensor connection

CAN BUS

Terminal connection	Description
+	+12 V DC
H	CAN H
L	CAN L
–	GND

Safety outputs
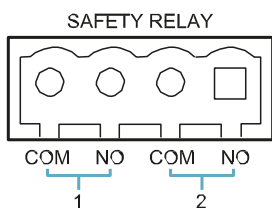
SAFETY RELAY

Terminal connection	Description
COM	Common safety output 1
NO	Relay output, normally open
COM	Common safety output 2
NO	Relay output, normally open

Universal outputs

AUX RELAY

Functions:
status warning field intrusion,
diagnosis signal, muting status
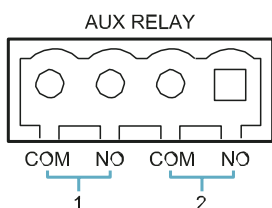
Terminal connection	Description
COM	Common auxiliary output 1
NO	Relay output, normally open
COM	Common auxiliary output 2
NO	Relay output, normally open

Voltage supply

POWER IN
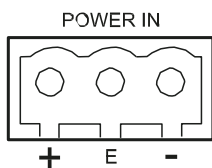
Terminal connection	Description
+	+24 V DC
E	Earthing
–	GND

Universal inputs
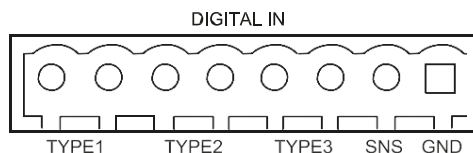
DIGITAL IN

Functions:
emergency stop button, manual restart interlock,
muting function

Terminal connection	Description
Type 1	Input, 24 V DC
Type 2	Input, 24 V DC
Type 3	Input, 24 V DC
SNS	Input, 24 V DC, diagnostics
GND	Common reference for all digital inputs

The cables used must be maximum 30 m long

Accessories required for commissioning

Description	Number	Items sup-plied	Further information
Connection cable sensor to evaluation unit	1	–	➜ Plug connectors and cables
Connection cable sensor to sensor (with several sensors)	1	–	➜ Plug connectors and cables
Terminating resistor (sensor)	1	–	➜ Plug connectors and cables
Configuration cable Micro-USB	1	–	➜ Plug connectors and cables
safeRS Designer	1	–	➜ **www.sick.com/safeRS**
safeRS USB driver	1	–	➜ **www.sick.com/safeRS**
Operating instructions	1	–	➜ **www.sick.com/safeRS**

Accessories

Connection systems

Connecting cables

- **Description:** A-coded
- **Model:** shielded

Figure	Connection type		Conductor cross-section	Length of cable	Type	Part no.
Illustration may differ	Female connector, M12, 5-pin, straight	Flying leads	$2 \times 0{,}34\ mm^2 + 2 \times 0{,}25\ mm^2 + 1 \times 0{,}34\ mm^2$	2 m	DOL-1205-G02MY	6053041
				5 m	DOL-1205-G05MY	6053042
				10 m	DOL-1205-G10MY	6053043

Connection cables

Figure	Connection type		Description	Model	Conductor cross-sec-tion	Length of cable	Type	Part no.
Illustration may differ	Female connector, M12, 5-pin, straight	Male connector, M12, 5-pin, straight	A-coded	PUR, hal-ogen-free, shielded	$2 \times 0{,}34\ mm^2 + 2 \times 0{,}25\ mm^2 + 1 \times 0{,}34\ mm^2$	2 m	DSL-1205-G02MY	6053044
	Male connector, USB-A	Male connector, Micro-B	–	Unshielded	–	2 m	USB cable	6036106
	Male connector, USB-A, straight	Female connector, USB-A, straight	Used to extend the USB interface by 10 m. The cable can be extended up to 20 m by plugging in another 10 m exten-sion.	Unshielded	–	10 m	USB extension cable, repeater	6069292

Other connectors and cables

Description	Type	Part no.
Terminating plug with a 120 Ω resistor for the last sensor in the system	Terminating plug	6073830

You can find additional accessories online ➜ **www.sick.com/safeRS**

SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 9,700 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents, and preventing damage to the environment.

SICK has extensive experience in various industries and understands their processes and requirements. With intelligent sensors, SICK delivers exactly what the customers need. In application centers in Europe, Asia, and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes SICK a reliable supplier and development partner.

Comprehensive services round out the offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

That is "Sensor Intelligence."

Worldwide presence:

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Hong Kong, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and further locations ➜ **www.sick.com**

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