



Figure can vary

**Part no.: 53800269**  
**RSL425-L/CU416-5**  
**Safety laser scanner**



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- Technical data
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## Technical data

<b>Basic data</b>	
Series	RSL 400
Application	Mobile danger zone guarding Mobile side guarding Stationary access guarding Stationary danger zone guarding
<b>Special design</b>	
Special design	Measurement data output optimized for vehicle navigation
<b>Functions</b>	
Functions	Dynamic contactor monitoring (EDM), selectable E-stop linkage Four-field mode Resolution, selectable
<b>Characteristic parameters</b>	
Type	3 , IEC/EN 61496
SIL	2 , IEC 61508
SILCL	2 , IEC/EN 62061
Performance Level (PL)	d , EN ISO 13849-1
PFH <sub>D</sub>	9E-08 per hour
Mission time T <sub>M</sub>	20 years , EN ISO 13849-1
Category	3 , EN ISO 13849
<b>Protective field data</b>	
Scanning angle	270 °
Minimum adjustable range	50 mm
Number of field pairs, reversible	10
Number of quads, reversible	10
Number of protective functions	1 Piece(s)
Number of independent sensor configurations	1
Diffuse reflection, min.	1.8 %
Operating range	0 ... 6.25 m
<b>Warning field data</b>	
Number of field pairs	10
Operating range	0 ... 20 m
Object size	150 mm x 150 mm
Diffuse reflection, min.	10 %
<b>Optical data</b>	
Light source	Laser , Infrared
Laser light wavelength	905 nm
Laser class	1 , IEC/EN 60825-1:2007
Transmitted-signal shape	Pulsed
Repetition frequency	90 kHz
<b>Measurement data</b>	

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Detection range	0 ... 50 m , Diffuse reflection > 90%
Diffuse reflection	20 %
Angular resolution	0.1 °
Distance resolution, radial	1 mm
Distance resolution, lateral	0.1 °
Systematic measurement error $D_{meas} - D_{real}$	min.: -20 mm typ.: -10 mm max.: 0 mm (Diffuse reflection: 1.8% ... retro-reflector Measurement range: 0.2 ... 25 m)
Measurement value noise	10 mm , 1 $\sigma$ (• Diffuse reflection: 1.8% ... 20% Measurement range: 0 ... 9 m • Diffuse reflection: 20% ... retro-reflector Measurement range: 0 ... 25 m)
Laser spot (H x W), 10 m	60 mm x 13 mm
Laser spot (H x W), 20 m	165 mm x 24 mm
Laser spot (H x W), 30 m	265 mm x 40 mm
Laser spot (H x W), 40 m	285 mm x 57 mm

### Electrical data

Protective circuit	Overvoltage protection
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### Performance data

Supply voltage $U_B$	24 V , DC , -30 ... 20 %
Current consumption (without load), max.	700 mA , (use power supply unit with 3 A)
Power consumption, max.	17 W , For 24 V, plus output load

### Outputs

Number of safety-related switching outputs (OSSDs)	2 Piece(s)
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### Safety-related switching outputs

Type	Safety-related switching output OSSD
Switching voltage high, min.	20.8 V
Switching voltage low, max.	2 V
Voltage type	DC

### Safety-related switching output 1

Assignment	Connection 1, gray wire
Switching element	Transistor , PNP

### Safety-related switching output 2

Assignment	Connection 1, pink wire
Switching element	Transistor , PNP

### Service interface

Type	Bluetooth
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### Bluetooth

Function	Configuration/parametering
Frequency band	2,400 ... 2,483.5 MHz
Radiated transmitting power	Max. 4.5 dBm (2.82 mW), class 2

Type	USB
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### USB

Function	Configuration/parametering
Connection	USB 2.0 mini-B, socket
Transmission speed, max.	12 Mbit/s
Cable length	≤ 5m Longer cable lengths are possible using active cables.

<b>Connection</b>	
Number of connections	2 Piece(s)
<b>Connection 1</b>	
Type of connection	Cable
Function	Machine interface
Cable length	5,000 mm
Sheathing material	PVC
Cable color	Black
Number of conductors	16 -wire
Wire cross section supply	1 mm <sup>2</sup>
Wire cross section signals	0.14 mm <sup>2</sup>
<b>Connection 2</b>	
Type of connection	Connector
Function	Data interface
Thread size	M12
Type	Female
Material	Metal
No. of pins	4 -pin
Encoding	D-coded
<b>Cable properties</b>	
Cable resistance, max.	15 Ω

<b>Mechanical data</b>	
Dimension (W x H x L)	140 mm x 149 mm x 140 mm
Housing material	Metal Plastic , Diecast zinc ,
Lens cover material	Plastic/PC
Net weight	3,000 g
Housing color	Yellow, RAL 1021
Type of fastening	Mounting plate Through-hole mounting Via optional mounting device

<b>Operation and display</b>	
Type of display	Alphanumerical display LED indicator
Number of LEDs	3 Piece(s)
Type of configuration	Software Sensor Studio
Operational controls	Software Sensor Studio

<b>Environmental data</b>	
Ambient temperature, operation	0 ... 50 °C
Ambient temperature, storage	-20 ... 60 °C
Relative humidity (non-condensing)	15 ... 95 %

<b>Certifications</b>	
Degree of protection	IP 65
Protection class	III , EN 61140
Certifications	TÜV Süd
Test procedure for EMC in accordance with standard	DIN 40839-1/3 EN 61496-1

Test procedure for oscillation in accordance with standard	EN 60068-2-6
Test procedure for continuous shock in accordance with standard	IEC 60068-2-29
US patents	US 10,304,307B US 7,656,917 B US 7,696,468 B US 8,520,221 B

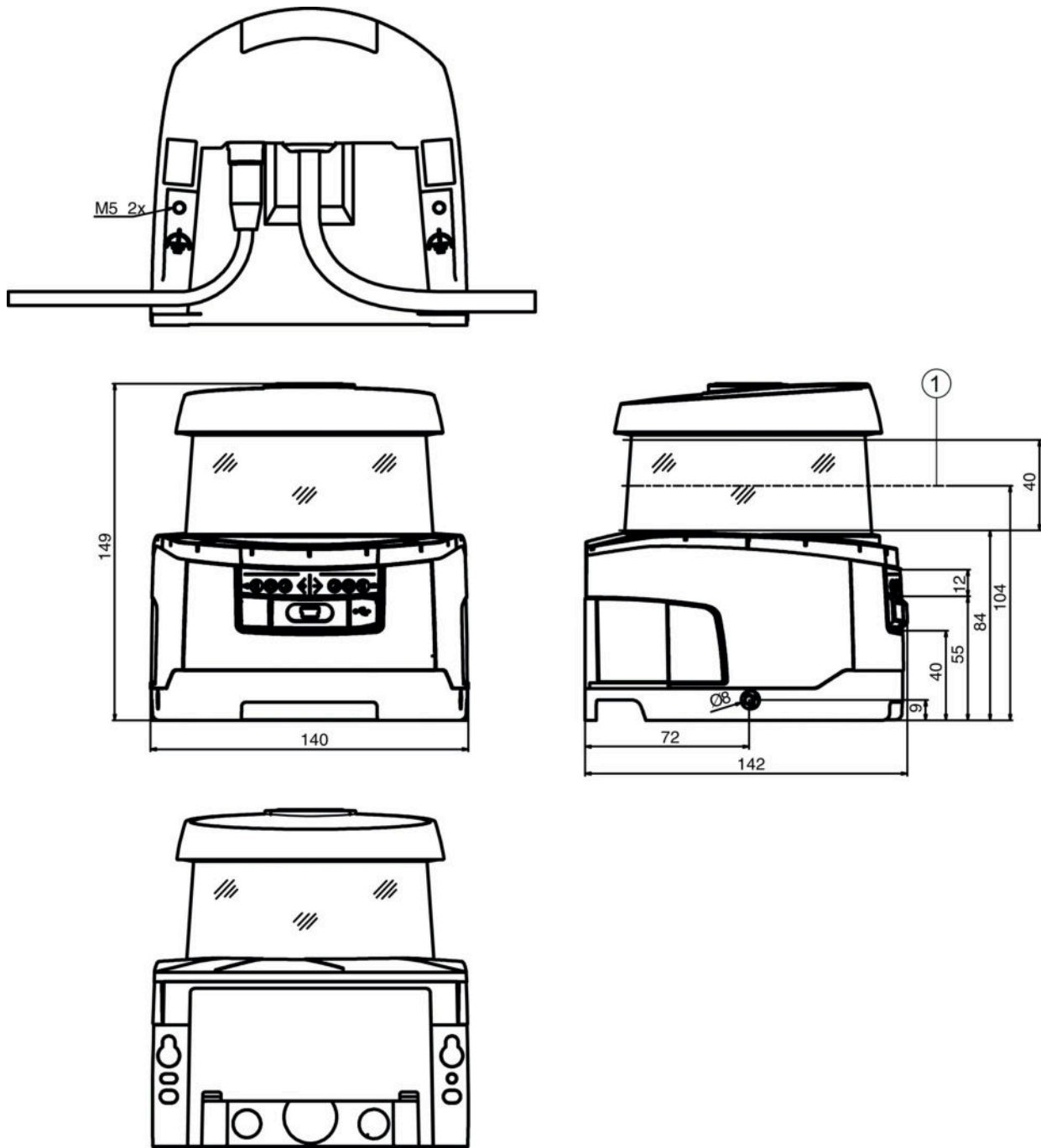
**Classification**

Customs tariff number	85365019
eCl@ss 8.0	27272705
eCl@ss 9.0	27272705
ETIM 5.0	EC002550
ETIM 6.0	EC002550

## Dimensioned drawings

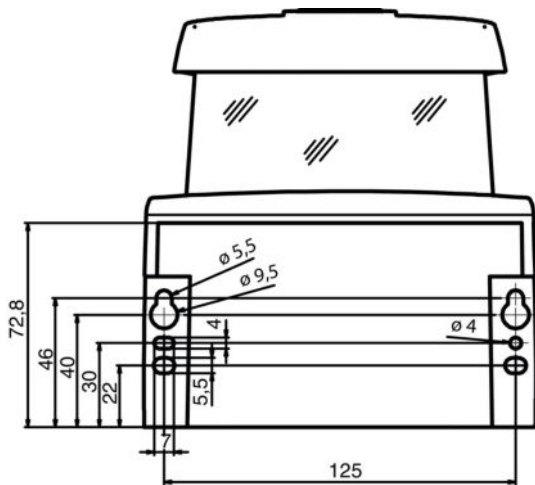
All dimensions in millimeters

Dimensions safety laser scanner with connection unit

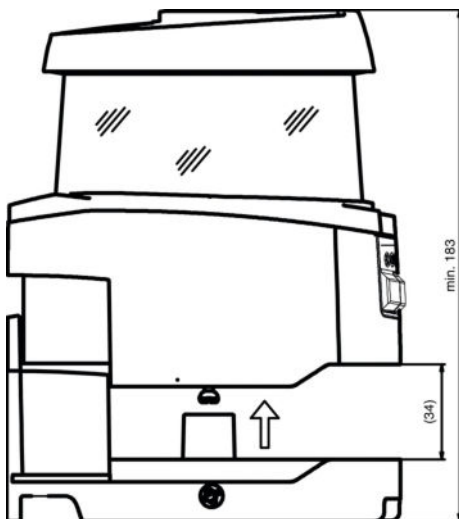


1 Scan level

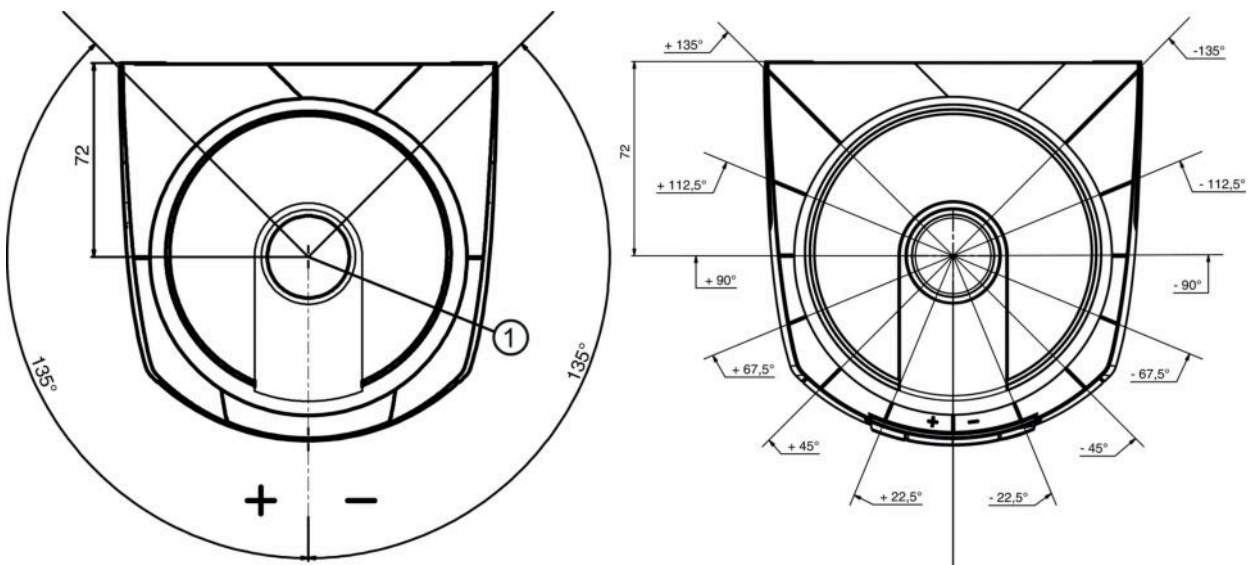
Mounting dimensions safety laser scanner with connection unit



Minimum space requirements for installation and replacement of scanner unit



Dimensions of scanning range



1 Reference point for distance measurement and protective field radius

## Electrical connection

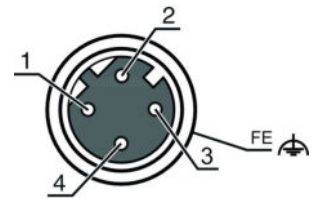
Connection 1	
Type of connection	Cable
Function	Machine interface
Cable length	5,000 mm
Sheathing material	PVC
Cable color	Black
Number of conductors	16 -wire
Wire cross section	
Wire cross section supply	1 mm <sup>2</sup>
Wire cross section signals	0.14 mm <sup>2</sup>

Conductor color	Conductor assignment
White	RES1
Brown	+24V
Green	EA1
Yellow	A1
Gray	OSSDA1
Pink	OSSDA2
Blue	GND / Ground
Red	MELD
Black	F1
Violet	F2
Gray Pink	F3
Blue Red	F4
Green White	F5
Brown Green	SE1
White Yellow	SE2
Brown Yellow	A2

Connection 2	
Type of connection	Connector
Function	Data interface
Thread size	M12
Type	Female
Material	Metal
No. of pins	4 -pin
Encoding	D-coded
Connector housing	FE/SHIELD

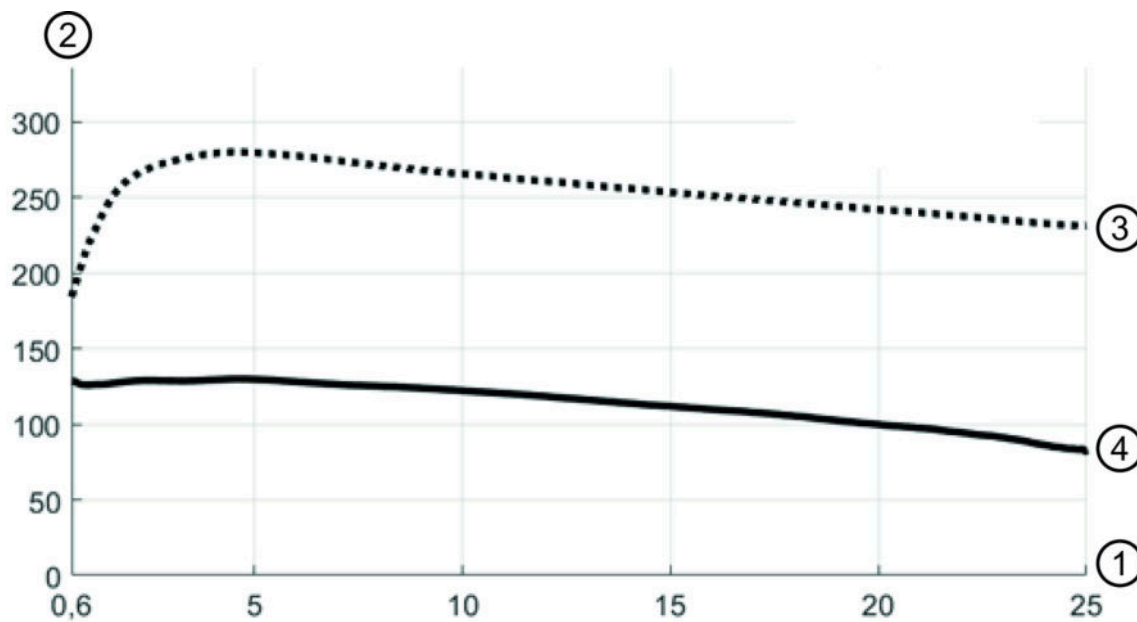


Pin	Pin assignment	Conductor color
1	TD+	Yellow
2	RD+	White
3	TD-	Orange
4	RD-	Blue
5		



## Diagrams

Signal strength curves depending on the distance



- 1 Object distance [m]
- 2 Signal strength
- 3 Retro-reflector film
- 4 White surface

The figure shows a typical curve of the signal strength transmitted by the safety sensor as a function of the measured object distance and object diffuse reflection for the following boundary conditions:

- Angle of incidence of the laser beam: 0°
- Share of area of the light spot on the object: 100%

## Operation and display

### LEDs

LED	Display	Meaning
1	Off	Device switched off
	Red, continuous light	OSSD off
	Red, flashing	Error
	Green, continuous light	OSSD on
2	Off	RES deactivated or RES activated and released
	Yellow, flashing	Protective field occupied
	Yellow, continuous light	RES activated and blocked but ready to be unlocked - protective field free and linked sensor is enabled if applicable

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LED	Display	Meaning
3	Off	Free warning field
	Blue, continuous light	Warning field interrupted
4	Off	Four field mode: warning field 3 free
	Blue, continuous light	Four field mode: warning field 3 interrupted
5	Yellow, flashing	Four field mode: warning field 2 interrupted

## Notes

### Observe intended use!

- The product may only be put into operation by competent persons.
- Only use the product in accordance with its intended use.

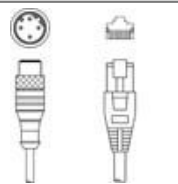
### WARNING! INVISIBLE LASER RADIATION – LASER CLASS 1

The device satisfies the requirements of IEC 60825-1:2007 (EN 60825-1:2007) safety regulations for a product of **laser class 1** as well as the U.S. 21 CFR 1040.10 regulations with deviations corresponding to "Laser Notice No. 50" from June 24, 2007.


- Observe the applicable statutory and local laser protection regulations.
- The device must not be tampered with and must not be changed in any way.  
There are no user-serviceable parts inside the device.  
Repairs must only be performed by Leuze electronic GmbH + Co. KG.

## Accessories

### Connection technology - Interconnection cables


	Part no.	Designation	Article	Description
	50135081	KSS ET-M12-4A-RJ45-A-P7-050	Interconnection cable	Suitable for interface: Ethernet Connection 1: Connector, M12, Axial, Male, D-coded, 4 -pin Connection 2: RJ45 Shielded: Yes Cable length: 5,000 mm Sheathing material: PUR

### Mounting technology - Mounting brackets



	Part no.	Designation	Article	Description
	53800134	BT840M	Mounting bracket	Application: Mounting on chamfered 90° corner Dimensions: 84.9 mm x 72 mm x 205.2 mm Color: Yellow, RAL 1021 Type of fastening, at system: Through-hole mounting Type of fastening, at device: Screw type Material: Metal

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## Mounting

	Part no.	Designation	Article	Description
	53800131	BTP800M	Loop guard	Dimensions: 160 mm x 169 mm Color: Black Material: Metal

## Services

	Part no.	Designation	Article	Description
	S981051	CS40-I-141	Safety inspection "Safety laser scanners"	Details: Checking of a safety laser scanner application in accordance with current standards and guidelines. Inclusion of the device and machine data in a database, production of a test log per application. Conditions: It must be possible to stop the machine, support provided by customer's employees and access to the machine for Leuze employees must be ensured. Restrictions: Travel costs and accommodation expenses charged separately and according to expenditure.
	S981047	CS40-S-141	Start-up support	Details: For safety devices including stopping time measurement and initial inspection. Conditions: Devices and connection cables are already mounted, price not including travel costs and, if applicable, accommodation expenses. Restrictions: Max. 3 h., no mechanical (mounting) and electrical (wiring) work performed, no changes (attachments, wiring, programming) to third-party components in the nearby environment.

### Note

A list with all available accessories can be found on the Leuze electronic website in the Download tab of the article detailed page.