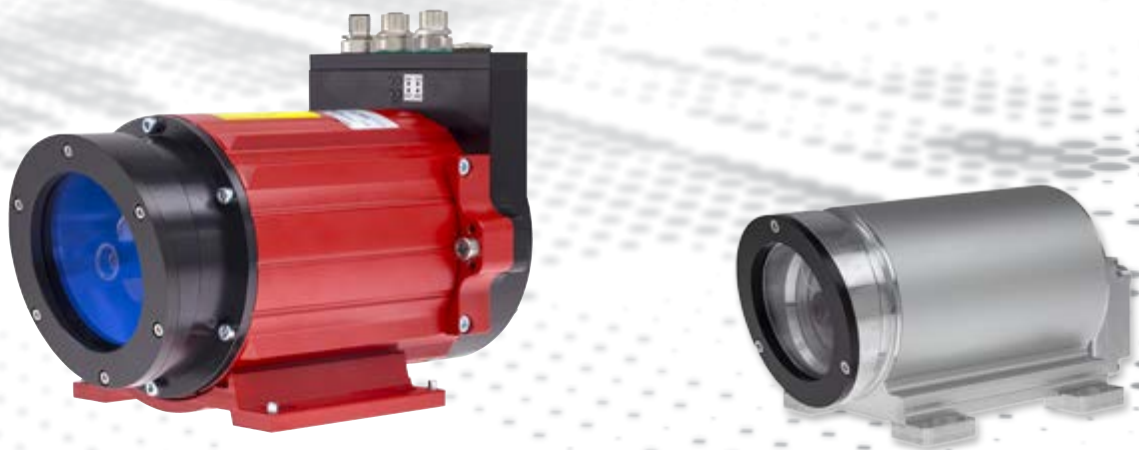


Laser distance measurement



Laser Distance Measuring Systems



Measurement over long distances without contact and fast enough for closed-loop control

Laser distance measuring systems from TR-Electronic are powerful optical sensors, which enable measurement of long distances without contact. The measuring system comprises a laser light source, light collector, electronic evaluation and data interface.

Our laser distance measuring systems LE200 enable absolute and wear-free measurement of long distances up to 240 m, which can then be output via SSI, field bus interface or industrial ethernet. Our barcode positioning systems even enable an absolute measuring distance of 10,000 meters.

Using our in-house laser reference measuring section we can compare our laser measuring systems of up to 240 m with a reference system and also linearize them accordingly. We can thus achieve an absolute repeatability of ± 2 mm at speeds which are commonplace in high-rack warehouses.

For shorter measuring lengths, the LE25 proves its strengths in the measuring range from 0.2 to 48 m.

Measurement systems LLB502 measure on quite all surfaces with up to 100 m distance, with corresponding reflector up to 500 m. LLB502 provide analog and SSI, with an optional interface module, fieldbusses and industrial ethernet is available.



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Laser Distance Measuring Systems – LE200 / LE25



Measurement over long distances without contact and fast enough for closed-loop control



























Particularly in the area of modern warehouse setups, such as shelf-stacking devices, transfer belts and crane systems, a powerful, decentralized measuring and control system for simple project processing and quick configuration makes all the difference. Movements up to 240 m/48 m are recorded with the LE200/LE25 laser distance measuring device. The visible red light laser facilitates setup and adjustment of the measuring system. A continuous light beam is used during operation. With just 1 millisecond of measuring cycle time, the LE200 can be directly used for position control.

- _ Robust design
- _ Records linear movement patterns
- _ Contact-free and wear-free distance measurement
- _ Distances up to 48 m, 125 m, 170 m, 195 m, 240 m
- _ Flexible programming
- _ Option with Integrated heating
- _ Option with high-temperature Laser diode to 60 °C ambient temperature
- _ Option with external cooling for 100 °C ambient temperature
- _ Customized adaptations upon request

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Position detection for closed loop application up to 240 m

Product	LE200	LE200 – long range	LE25
			
Supply voltage	18 ... 27 VDC	18 ... 27 VDC	18 ... 27 VDC
_ Integrated heating	24 ... 30 VDC	24 ... 30 VDC	24 VDC ± 5 %
Current consumption, no load	< 350 mA	< 350 mA	<= 150 mA
_ Integrated heating	< 2.5 A	< 2.5 A	24 W
Range	0,2 ... 125 m	0,2 ... 170 m, 195 m, 240 m	0,2 ... 25 m, 0,2 ... 48 m
Accuracy	±5 mm	±5 mm	±2 mm
Reproducibility	±2 mm	±2 mm	±2 mm
Light source	Laser diode, red light	Laser diode, red light	Laser diode, red light
Wave length λ	670 nm	670 nm	670 nm
Radiant power	Pmax < 1 mW	Pmax < 1 mW	Pmax < 1 mW
Laser protection class	2	2	2
Measurand output/refresh rate	1.000 values / s	1.000 values / s	1.000 values / s
Integration time	1 ms	1 ms	1 ms
Working temperature	0 ... +50 °C	0 ... +50 °C	0 ... +50 °C
Working temperature (+ heating)	-30 ... +50 °C	-30 ... +50 °C	-30 ... +50 °C
Storage temperature	-20 ... +75 °C (dry)	-20 ... +75 °C (dry)	-20 ... +75 °C (dry)
Protection class	IP 65	IP 65	IP 65
Vibration	<50 m/s ² , sine 50 ... 2,000 Hz	<50 m/s ² , sine 50 ... 2,000 Hz	<50 m/s ² , sine 50 ... 2,000 Hz
Shock	<300 m/s ² , half sine 11 ms Hz	<300 m/s ² , half sine 11 ms Hz	<300 m/s ² , half sine 11 ms Hz
Interface (others on request)	       	         	    
Weblink	www.tr-electronic.com/s/S007232	www.tr-electronic.com/s/S007232	www.tr-electronic.com/s/S007232
QR-Code			

Can't find the right variant? Please contact us (info@tr-electronic.de)

Suggested Products

Ordering code	Range	Delivery
LE200 SSI		
2200-04002	50 m	with reflector 200 × 200 mm
2200-00002	125 m	with reflector 200 × 200 mm
2200-01002	170 m	with reflector panel 554 × 480 mm
2200-02002	195 m	with reflector panel 554 × 480 mm
2200-03002	240 m	with reflector panel 554 × 480 mm
LE200 PROFIBUS+SSI		
2200-04102	50 m	with reflector 200 × 200 mm
2200-00102	125 m	with reflector 200 × 200 mm
2200-01102	170 m	with reflector panel 554 × 480 mm
2200-02102	195 m	with reflector panel 554 × 480 mm
2200-03102	240 m	with reflector panel 554 × 480 mm
LE200 Interbus S		
2200-00202	125 m	with reflector 200 × 200 mm
2200-01202	170 m	with reflector panel 554 × 480 mm
LE200 CANopen		
2200-04302	50 m	with reflector 200 × 200 mm
2200-00302	125 m	with reflector 200 × 200 mm
2200-01302	170 m	with reflector panel 554 × 480 mm
2200-02302	195 m	with reflector panel 554 × 480 mm
2200-03302	240 m	with reflector panel 554 × 480 mm
LE200 DeviceNET		
2200-04402	50 m	with reflector 200 × 200 mm
2200-00402	125 m	with reflector 200 × 200 mm
2200-02402	195 m	with reflector panel 554 × 480 mm
2200-03452	240 m	with reflector panel 554 × 480 mm
LE200 Ethernet/IP		
2200-00702	125 m	with reflector 200 × 200 mm
2200-01702	170 m	with reflector panel 554 × 480 mm
2200-02702	195 m	with reflector panel 554 × 480 mm
2200-03702	240 m	with reflector panel 554 × 480 mm

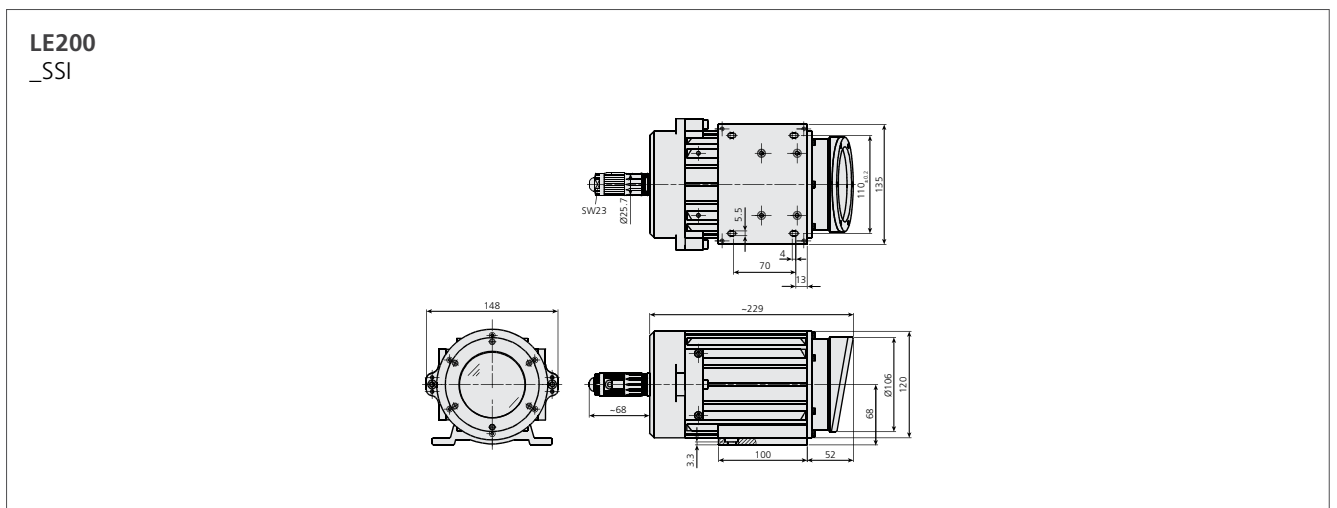
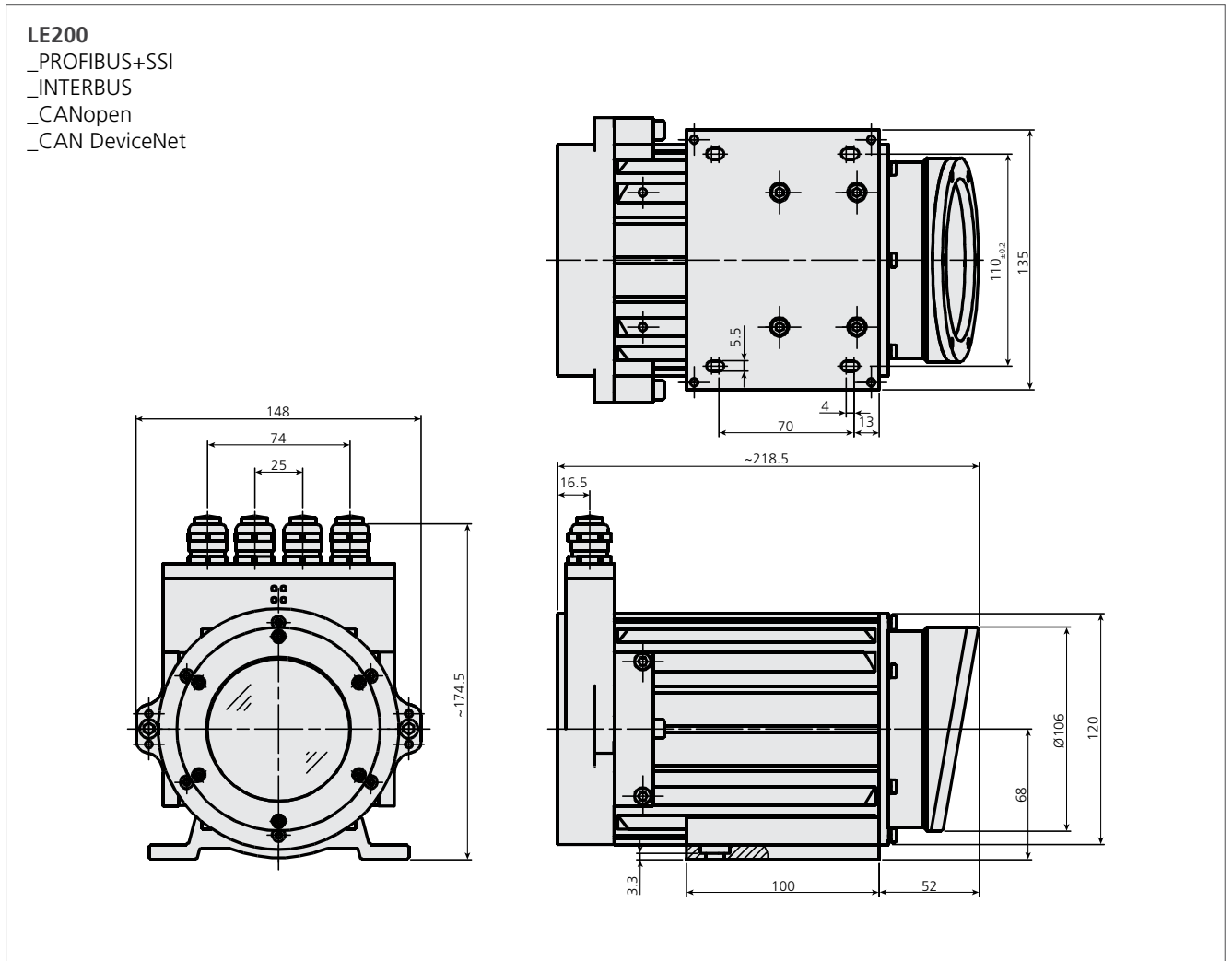
For further product information simply enter the order number in the search field at www.tr-electronic.com.

Suggested Products

Ordering code	Range	Delivery
LE200 PROFINET		
2200-04802	50 m	with reflector 200 × 200 mm
2200-00802	125 m	with reflector 200 × 200 mm
2200-01802	170 m	with reflector panel 554 × 480 mm
2200-02802	195 m	with reflector panel 554 × 480 mm
2200-03802	240 m	with reflector panel 554 × 480 mm
LE200 EtherCAT		
2200-00902	125 m	with reflector 200 × 200 mm
LE25 SSI		
2600-00002	25 m	with reflector 100 × 100 mm
2600-01002	48 m	with reflector 100 × 100 mm
LE25 PROFINET+SSI		
2600-00800	25 m	with reflector 100 × 100 mm
2600-01800	48 m	with reflector 100 × 100 mm
LE25 PROFINET		
2600-00802	25 m	with reflector 100 × 100 mm
2600-01802	48 m	with reflector 100 × 100 mm
LE25 Ethernet/IP		
2600-00702	25 m	with reflector 100 × 100 mm
2600-01702	48 m	with reflector 100 × 100 mm
LE25 EtherCAT		
2600-00902	25 m	with reflector 100 × 100 mm
2600-01902	48 m	with reflector 100 × 100 mm
LE25 EtherCAT+SSI		
2600-00900	25 m	with reflector 100 × 100 mm

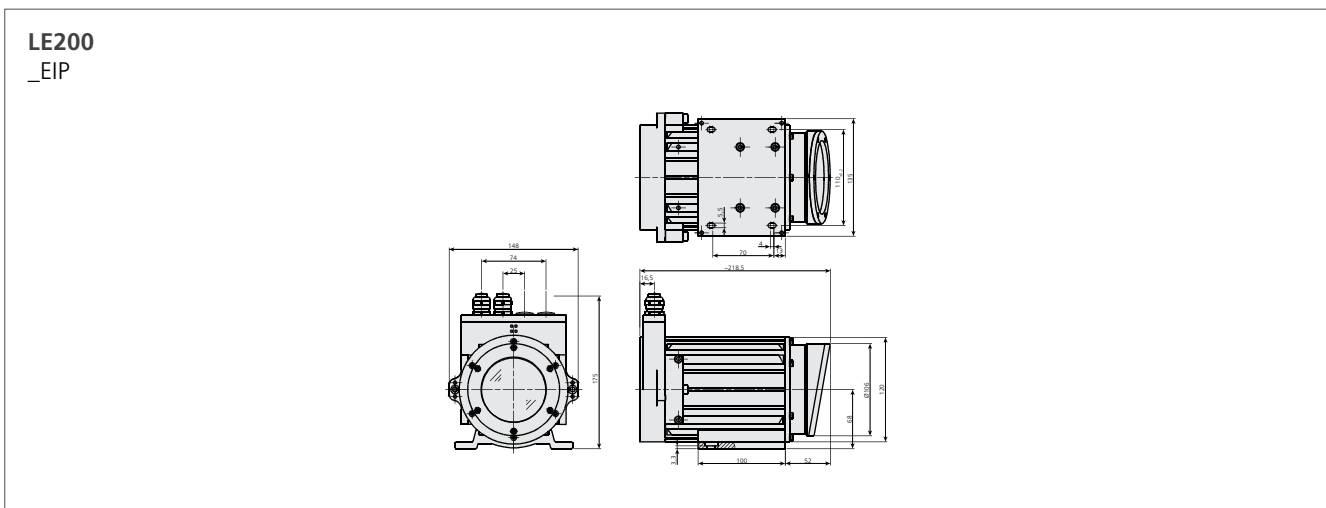
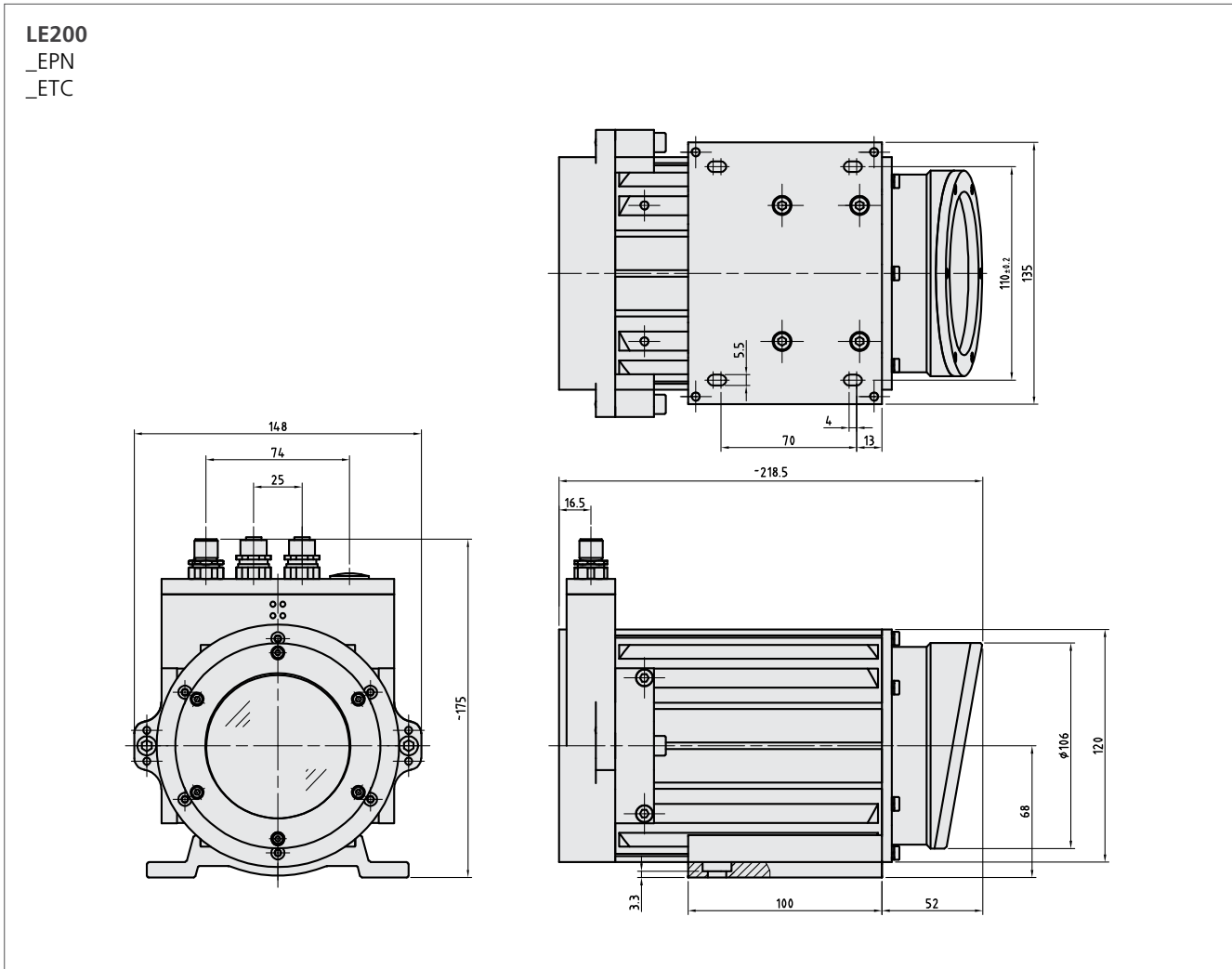
For further product information simply enter the order number in the search field at www.tr-electronic.com.

Dimensional Drawings



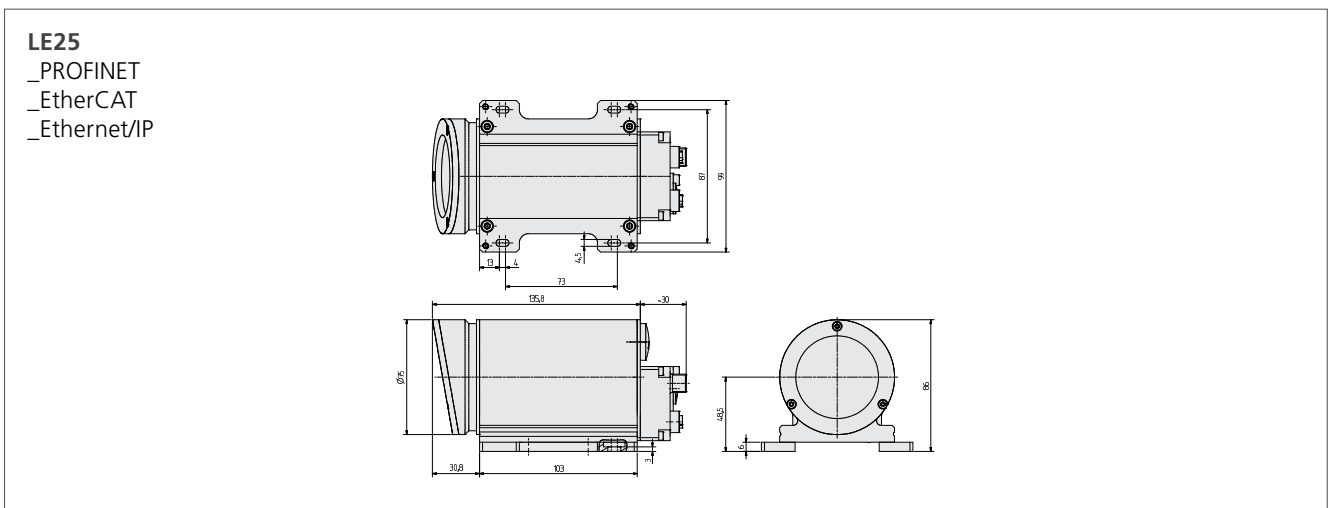
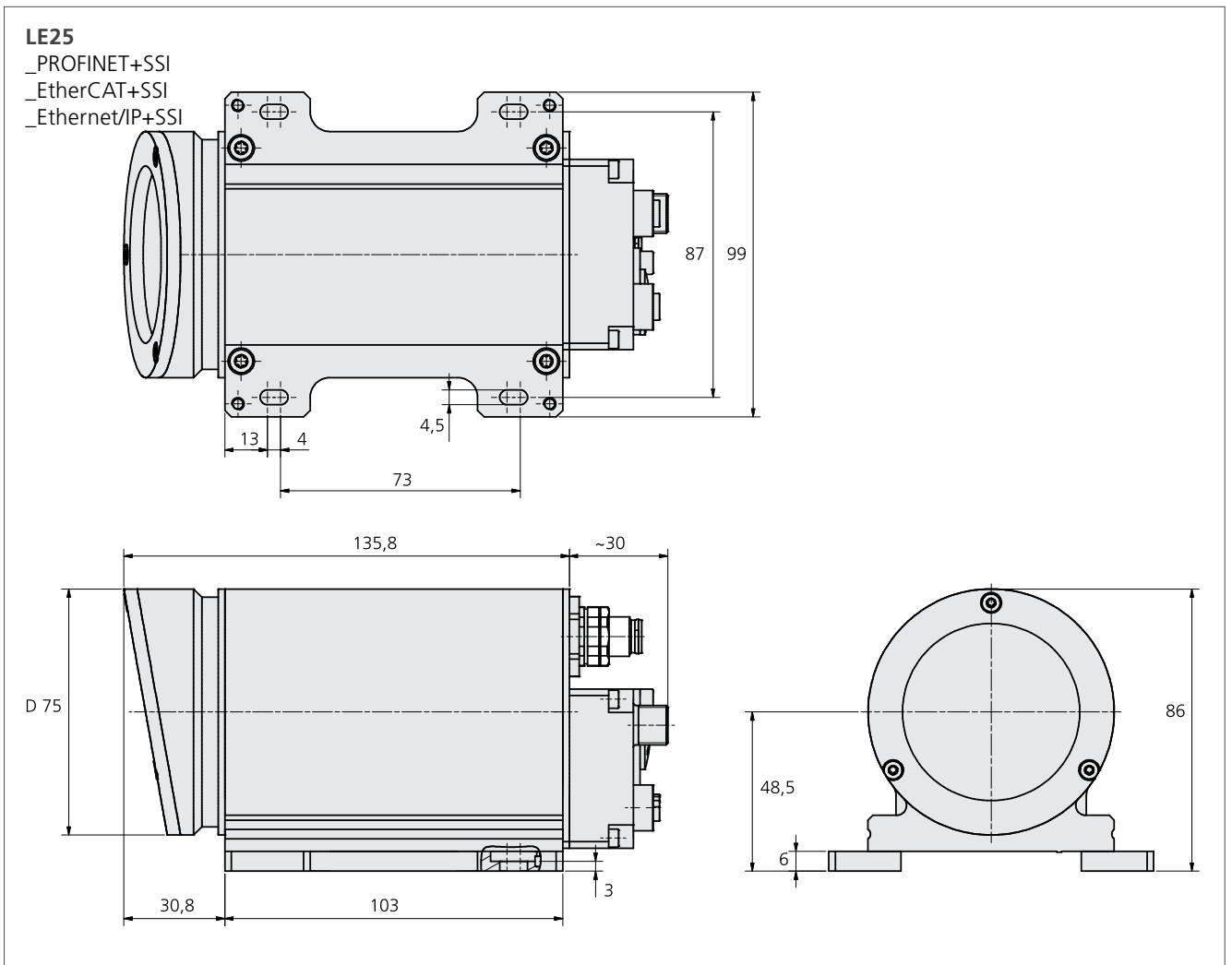
Illustrations are schematic diagrams. Binding dimension drawings and CAD data for specific order numbers at www.tr-electronic.com or on request.

Dimensional Drawings



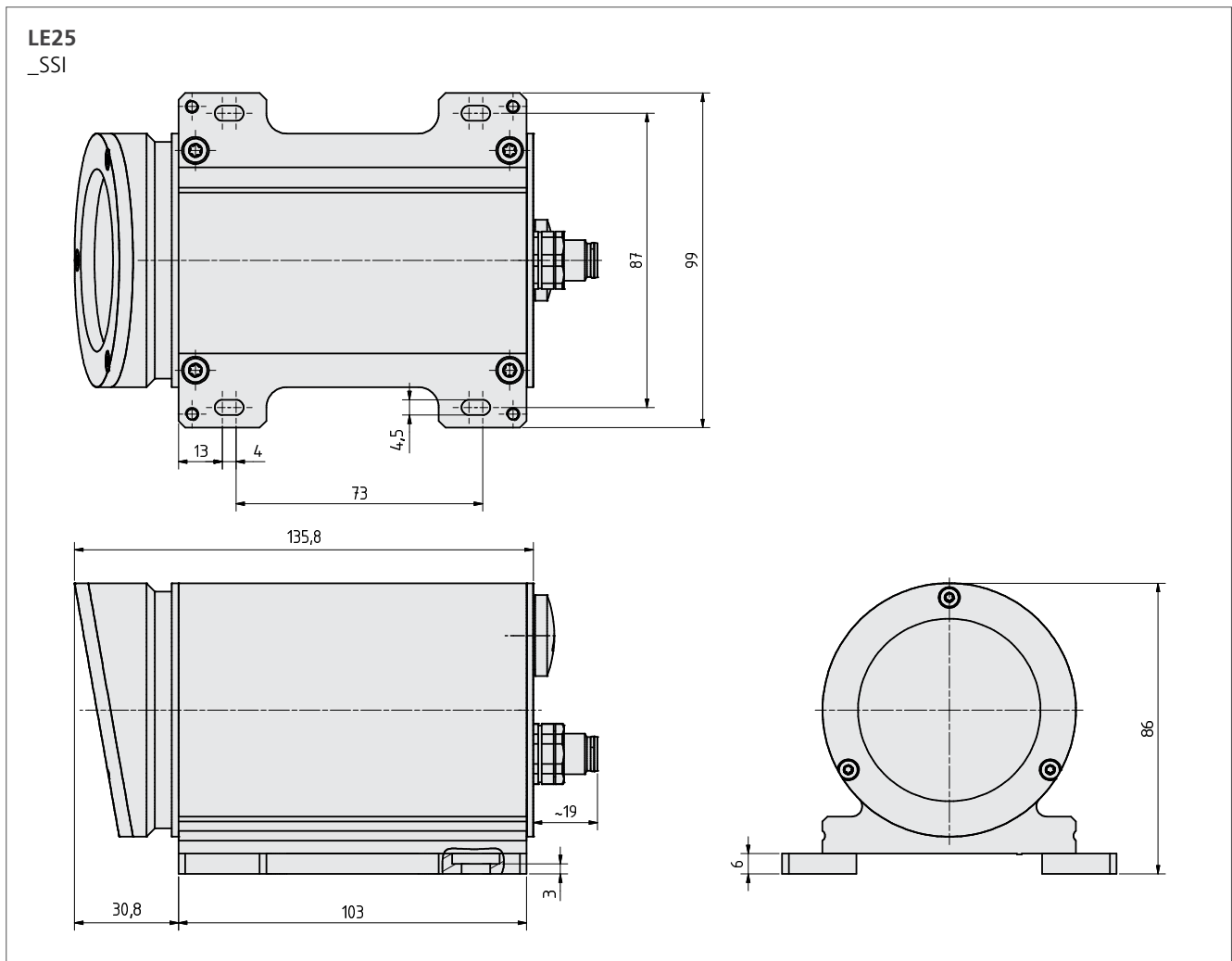
Illustrations are schematic diagrams. Binding dimension drawings and CAD data for specific order numbers at www.tr-electronic.com or on request.

Dimensional Drawings



Illustrations are schematic diagrams. Binding dimension drawings and CAD data for specific order numbers at www.tr-electronic.com or on request.

Dimensional Drawings



Laser Distance Measuring Systems – LLB502



Non-contact measurement on natural surfaces





Laser distance measuring systems LLB502 can measure up to 100 m on natural surfaces without a special target plate. The measuring time and the maximum speed of the target depend on the surface. With a specific reflector plate, distances up to 500 m can be measured.

- _ Analog and SSI interface
- _ Interface Modules Ethernet/IP, PROFINET-IO, EtherCAT
- _ Detection of positions
- _ Non-contact distance measurement
- _ Distance measurements on natural surfaces:
 - _ max. 100 m
 - _ with reflector panel max. 500 m
- _ Programmable










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Position detection up to 500 m

Product	LLB502-A+SSI 100 m \pm 1 mm	LLB502-A+SSI 100 m \pm 3 mm
		
Supply voltage	12 ... 30 VDC	12 ... 30 VDC
Optional heating	no	no
Current consumption, no load	< 0.15 A	< 0.15 A
Range	0.05 ... 100 m	0.05 ... 100 m
Accuracy	\pm 1 mm (2 σ)	\pm 3 mm (2 σ)
Reproducibility	\pm 0.3 mm (2 σ)	\pm 0.7 mm (2 σ)
Time for a measurement	typically 0.05 ... 4 s	typically 0.05 ... 4 s
Tracking mode	typically 0.02 ... 4 s	typically 0.02 ... 4 s
Light source	Laser diode, red light	Laser diode, red light
Laser protection class	2	2
Mass	350 g	350 g
Working temperature	-10 ... +50 °C	-10 ... +50 °C
Working temperature with optional heating	-	-
Storage temperature	-40 ... +70 °C (dry)	-40 ... +70 °C (dry)
Protection class	IP 65	IP 65
Vibration [en]	\leq 50 m/s ² , sine 60 ... 150 Hz	\leq 50 m/s ² , sine 60 ... 150 Hz
Shock	\leq 500 m/s ² , half sine 11 ms	\leq 500 m/s ² , half sine 11 ms
Addl. Interfaces	RS232, RS422/485, USB 2.0	RS232, RS422/485, USB 2.0
Interface (others on request)	Analog SSI	Analog SSI
Weblink	www.tr-electronic.com/p/K-LLB502-A-1	www.tr-electronic.com/p/K-LLB502-A-1
QR-Code		

Laser Distance Measuring Systems – LLB502

Product	LLB502-A+SSI 500 m ±1 mm 	LLB502-A+SSI 500 m ±3 mm 	LLB502 Schnittstellen-Modul 
Supply voltage	12 ... 30 VDC	12 ... 30 VDC	12 ... 30 VDC
Optional heating	yes	yes	-
Current consumption, no load	< 0.15 A	< 0.15 A	< 0.6 A
Range	0.05 ... 100 m with target plate 0.5 ... 500 m	0.05 ... 100 m with target plate 0.5 ... 500 m	-
Accuracy	±1 mm (2 σ)	±3 mm (2 σ)	-
Reproducibility	±0.3 mm (2 σ)	±0.7 mm (2 σ)	-
Time for a measurement	typically 0.05 ... 4 s	typically 0.05 ... 4 s	-
Tracking mode	typically 0.004 ... 4 s	typically 0.004 ... 4 s	-
Light source	Laser diode, red light	Laser diode, red light	-
Laser protection class	2	2	-
Mass	350 g	350 g	90 g
Working temperature	-10 ... +50 °C	-10 ... +50 °C	-10 ... +50 °C
Working temperature with optional heating	-40 ... +60 °C	-40 ... +60 °C	-40 ... +50 °C
Storage temperature	-40 ... +70 °C (dry)	-40 ... +70 °C (dry)	-40 ... +70 °C (dry)
Protection class	IP 65	IP 65	IP 65 (if correctly mounted)
Vibration [en]	<= 50 m/s ² , sine 60 ... 150 Hz	<= 50 m/s ² , sine 60 ... 150 Hz	<= 50 m/s ² , sine 60 ... 150 Hz
Shock	<= 500 m/s ² , half sine 11 ms	<= 500 m/s ² , half sine 11 ms	<= 500 m/s ² , half sine 11 ms
Addl. Interfaces	RS232, RS422/485, USB 2.0	RS232, RS422/485, USB 2.0	-
Interface (others on request)	Analog SSI	Analog SSI	  
Weblink	www.tr-electronic.com/p/K-LLB502-A-2	www.tr-electronic.com/p/K-LLB502-A-2	www.tr-electronic.com/p/K-LLB502-ETN-1
QR-Code			

Suggested Products

Ordering code	Interface
LLB502 - 100 m no target plate	
LLB502-00001	Analog + SSI, ± 1 mm
LLB502-00003	Analog + SSI, ± 3 mm
LLB502 - 100 m no target plate (with target plate 500 m)	
LLB502-01111	Analog + SSI, ± 1 mm
LLB502-01213	Analog + SSI, ± 3 mm
LLB502 Bus cap	
LLB502-20700	Ethernet/IP
LLB502-20800	PROFINET-IO
LLB502-20900	EtherCAT
LLB502 Reflector Plate	
49500040	210 x 297 mm
49500053	600 x 1200 mm

Für mehr Produkt-Informationen tragen Sie einfach die Bestellnummer in das Suchfeld auf www.tr-electronic.de ein.

Further product information

1. Enter order code into ...



2. Searchfield (top right) on www.tr-electronic.com



3. Choose desired information



We will help you to select the most suitable products from the complete TR range. Please contact us (info@tr-electronic.de).

Dimensional Drawings

LLB502
Option: Ethernet hood

Pinout Table:

1	○	+12...30 VDC
2	○	GND, 0 V
3	○	DIGITAL_OUT1/IN1
4	○	DIGITAL_OUT2
5	○	DIGITAL_OUT3_Error
6	○	ANALOG_OUT+
7	○	RS232_Rx
8	○	RS232_Tx
9	○	SSI_DATA-_OUT / Tx-
10	○	SSI_DATA+_OUT / Tx+
11	○	SSI_Clock-_IN / Rx-
12	○	SSI_Clock+_IN / Rx+

Optional Ethernet connection caps

Ethernet PORT 1: 1: Tx+, 2: Rx+, 3: Tx-, 4: Rx-

Ethernet PORT 0: 1: +12...30 VDC, 2: GND, 0 V, 3: N.C., 4: N.C.

Power Supply: A: M12 A-coded, Male; B: M12 D-coded, Female

Ethernet/IP: LLB502-20700
PROFINET-IO: LLB502-20800
EtherCAT: LLB502-20900

Dimensions: 68 mm x 58 mm x 47 mm
Weight: 0.090 kg

Illustrations are schematic diagrams. Binding dimension drawings and CAD data for specific order numbers at www.tr-electronic.com or on request.



Barcode Positioning System – BE901



Non-contact measurement up to 10 km









Barcode positioning systems of type BE901 are optical measuring systems which use visible red laser light to determine the position of the BE901 relative to a permanently mounted barcode tape. Typically the BE 901 is mounted on a (rail-) guided vehicle, whose position is to be determined. The position information is determined to within a millimeter using the information of the fixed barcode tape and made available to the primary system.

- _ Interfaces: SSI, PROFIBUS and PROFinet
- _ Easy installation and activation
- _ Movements (curved systems)
- _ Non contact position measurement
- _ Position detection up to 10,000 m
- _ Parameterizable via USB

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Barcode Positioning System

Product	BE901 - SSI	BE901 - PB	BE901 - EPN
			
Supply voltage	18 ... 30 VDC	18 ... 30 VDC	18 ... 30 VDC
Power consumption	3.7 W	3.7 W	3.7 W
Power consumption (+ heating)	17.7 W	17.7 W	17.7 W
Range	10,000 m	10,000 m	10,000 m
Resolution	0.01 ... 10 mm	0.001 ... 10 mm	0.001 ... 10 mm
Reproducibility	± 0.15 mm (3 Sigma)	± 0.15 mm (3 Sigma)	± 0.15 mm (3 Sigma)
Traverse rate	10 m/s	10 m/s	10 m/s
Reaction Time	16 ms	16 ms	16 ms
Measurement value output	0.05 ... 2 ms	1 ms	2 ms
Scanning depth	50 ... 170 mm	50 ... 170 mm	50 ... 170 mm
Light source	Laser diode red, 655 nm	Laser diode red, 655 nm	Laser diode red, 655 nm
Laser class	1, IEC/EN60825-1:2014	1, IEC/EN60825-1:2014	1, IEC/EN60825-1:2014
Housing	Die-cast aluminium	Die-cast aluminium	Die-cast aluminium
Mass	580 g without connection block	580 g without connection block	580 g without connection block
Working temperature	-5 ... +50 °C	-5 ... +50 °C	-5 ... +50 °C
Working temperature (+ heating)	-35 ... +50 °C	-35 ... +50 °C	-35 ... +50 °C
Air humidity	max. 90% rel. humidity	max. 90% rel. humidity	max. 90% rel. humidity
Protection class	IP 65	IP 65	IP 65
Service Interface	USB	USB	USB
Interface	SSI		
Weblink	http://www.tr-electronic.com/s/S011970	http://www.tr-electronic.com/s/S011969	https://www.tr-electronic.com/s/S023253
QR-Code			

Can't find the right variant? Please contact us (info@tr-electronic.de)

Suggested Products

Ordering code	Range	Delivery
BE901 SSI		
40804-11000	-	without connection cap
40804-11002	Heating	without connection cap
40804-11001	Heating + Display	without connection cap
BE901 Profibus		
40804-12000	-	without connection cap
40804-12002	Heating	without connection cap
40804-12001	Heating + Display	without connection cap
BE901 PROFINet		
40804-13000	-	without connection cap
40804-13002	Heating	without connection cap
40804-13001	Heating + Display	without connection cap
Connection hood		
40804-22001	PB, M12	-
40804-22002	PB, cable glands	-
40804-21001	SSI, M12	-
40804-21002	PB, cable glands	-
40804-23001	EPN, cable glands	-

For further product information simply enter the order number in the search field at www.tr-electronic.com.

Further product information

1. Enter order code into ...



2. Searchfield (top right) on www.tr-electronic.com



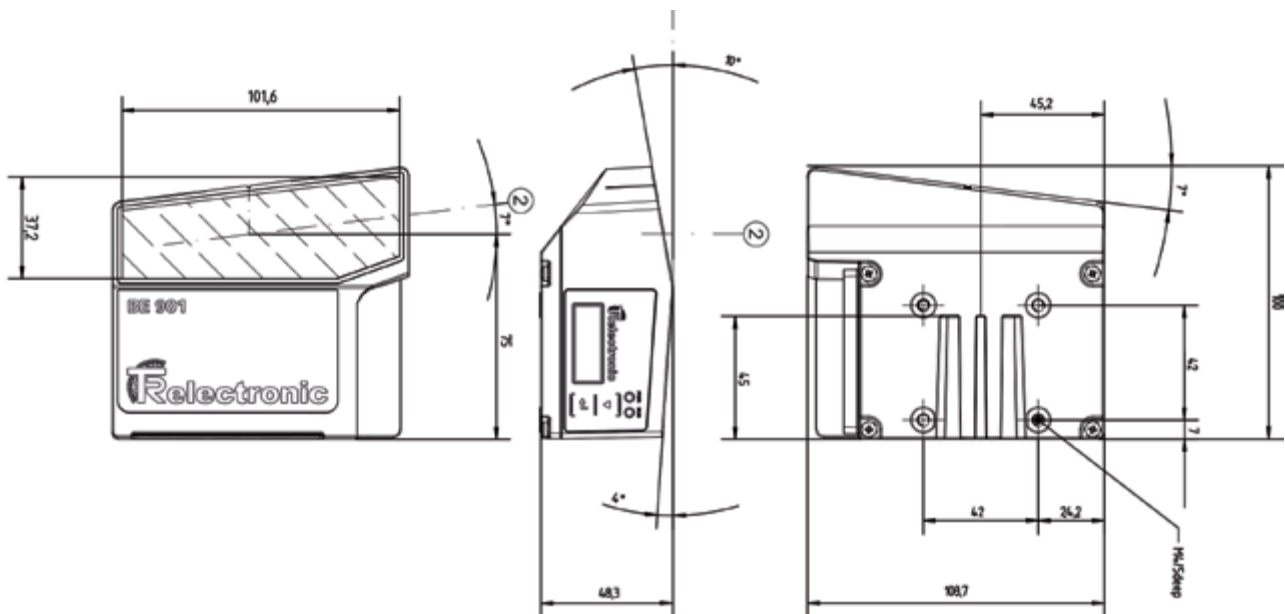
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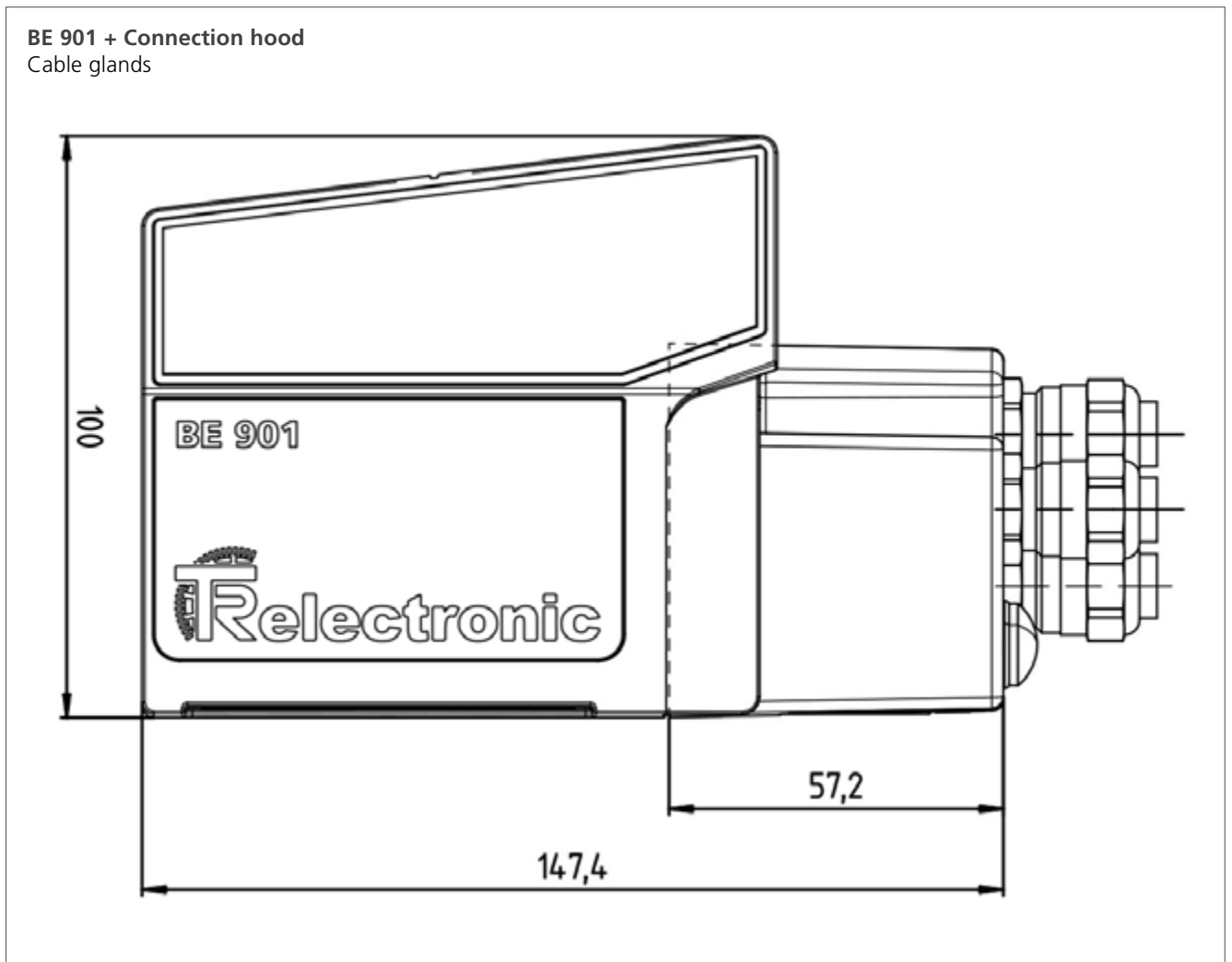
We will help you to select the most suitable products from the complete TR range. Please contact us (info@tr-electronic.de).

Dimensional Drawings

BE901
_SSI, _PB

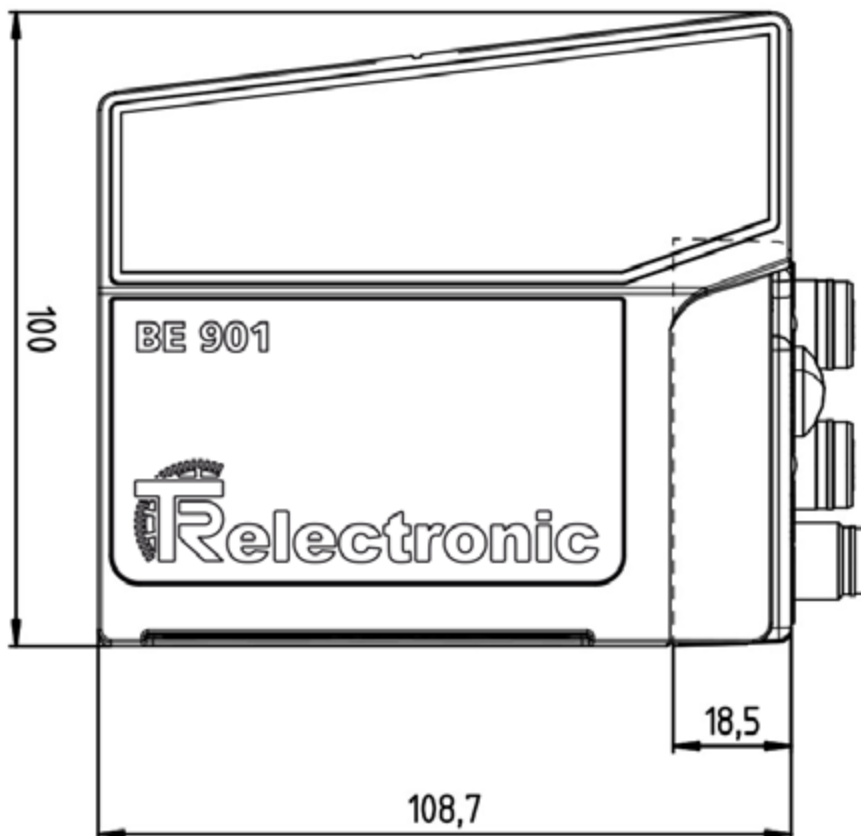


Dimensional Drawings



Dimensional Drawings

BE901 + Connection hood
M12

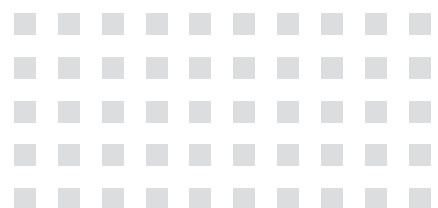


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Subject to technology and design modifications.

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