

Switching sensors

Well switched: Stable and reliable detection of all objects and packaging

Using various operating principles and technologies, switching sensors detect objects reliably – at either the start or end point of the application.

We offer a variety of sensors that detect an object optoelectronically, with ultra-sonics, inductively or capacitively, and output a stable switching signal. We meet the diverse requirements from the production and packaging industry with a large number of different light spots, operating principles, designs and sizes.

The usability when aligning and adjusting the switching point is simple and intuitive for all models. The sensors output standardized switching signals, NPN/PNP as well as IO-Link data, and can thus be integrated into all applications. Many series offer helpful additional functions to facilitate service intervals that are as long as possible.





To the point: New sensors with Power PinPoint® LED

Our optical sensors with Power PinPoint® LED are even easier to commission and ensure high process reliability.

Photoelectric proximity switches and photoelectric sensors with Power PinPoint® LED utilize innovative light source technology. Thanks to the newly developed light-emitting diode, the sensors' optical system generates a light spot that retains its size, shape and homogeneity throughout the sensor's entire working range.

Your benefits

- Simple sensor commissioning for object detection thanks to small, round, homogeneous light spot over the sensor's entire working range
- Perfect object tracking with precise start and end detection of the object with pinpoint response behavior
- Diffuse sensors detect small objects particularly reliably thanks to their optimum response behavior and high precision. Sensors with Power PinPoint® LEDs can also be used instead of laser light scanners in some applications
- Better detection results in applications with small reflectors and long distances thanks to higher function reserves for retro-reflective sensors
- Greater detection reliability with throughbeam photoelectric sensors in parallel operation of several sensors thanks to the compact light beam with low divergence and improved diffused light suppression



Optical sensors

Photoel. sensors / diffuse sensors, cubic housing



2 series
Universal, micro
CE UK CA UL



23 series
Standard
CE UK CA

Technical data	Dimensions without connector (W x H x D)	8 mm x 23.1 mm x 12 mm	11.4 mm x 34.2 mm x 18.3 mm
	Supply voltage U_B	10 ... 30 V, DC	10 ... 30 V, DC
	Interface		
	Switching outputs	Transistor	Transistor
	Connection type	Cable Cable with connector, M8 Cable with connector, M12	Cable Cable with connector, M8 Cable with connector, M12 Connector, M8
	Degree of protection	IP 67	IP 67
	Housing material	Plastic	Plastic
	Compatibility of materials		
	Ambient temperature, operation	-30 °C ... 55 °C	-40 °C ... 60 °C
Throughbeam photoelectric sensors	Min./max. operating range limit	0 m ... 2 m	0 m ... 10 m
	Light source	LED, Red	LED, Red
	Switching frequency	385 Hz	500 Hz
	Operational controls		
Retro-reflective photoelectric sensors	Min./max. operating range limit	0.07 m ... 4 m	0.1 m ... 6 m
	Light source	LED, Red	LED, Red
	Switching frequency	700 Hz	500 Hz
	Operational controls		
Energetic diffuse sensor	Min./max. operating range limit		0 m ... 0.7 m
	Light source		LED, Red
	Switching frequency		500 Hz
	Operational controls		Multiturn potentiometer
Diffuse sensors with background suppression	Min./max. operating range limit	0.001 m ... 0.06 m	0.005 m ... 0.4 m
	Light source	LED, Red	LED, Red
	Switching frequency	700 Hz	1,000 Hz
	Operational controls		Multiturn potentiometer
Functions	Activation input	X	
	Suppression of HF illumination (LED)		
	Autocollimation		
	Extra long light spot (XL)		
	Small light spot (S)	X	
	Teach input		
	Tracking function		
	Warning output		

**3C series**

Universal, mini

**5B series**

Standard

**28 series**

Standard, multimount



11.4 mm x 34.2 mm x 18.3 mm	11 mm x 32.4 mm x 20 mm	15 mm x 46.5 mm x 31.8 mm
10 ... 30 V, DC 12 ... 30 V, DC	10 ... 30 V, DC	10 ... 30 V, DC
IO-Link		
Transistor	Transistor	Transistor
Cable Cable with connector, M8 Cable with connector, M12 Connector, M8	Cable Cable with connector, M8 Cable with connector, M12 Cable with connector, Snap-in, M8 Cable with JST connector Connector, M8	Cable Cable with connector, M8 Cable with connector, M12 Connector, M12
IP 67 IP 69K	IP 67	IP 67
Plastic	Plastic	Plastic
ECOLAB	ECOLAB	
-40 °C ... 60 °C	-40 °C ... 60 °C	-40 °C ... 60 °C
0 m ... 10 m	0 m ... 17.5 m	0 m ... 15 m
Laser, Red LED, Red	LED, Infrared LED, Red Power PinPoint® LED, Red	LED, Infrared LED, Red
1,000 Hz ... 3,000 Hz	900 Hz	500 Hz
270° potentiometer		
0 m ... 7 m	0.02 m ... 7.5 m	0.02 m ... 6 m
Laser, Red LED, Red Power PinPoint® LED, Red	LED, Red Power PinPoint® LED, Red	LED, Red
1,500 Hz ... 3,000 Hz	500 Hz ... 1,000 Hz	500 Hz
270° potentiometer Teach button	270° potentiometer	Teach button
	0.001 m ... 1 m	0 m ... 0.85 m
	LED, Infrared LED, Red	LED, Red
	900 Hz	500 Hz
	Multiturn potentiometer	Teach button
0.005 m ... 0.6 m	0.002 m ... 0.4 m	
Laser, Red LED, Infrared LED, Red Power PinPoint® LED, Red	LED, Infrared LED, Red Power PinPoint® LED, Red	
250 Hz ... 3,000 Hz	1,000 Hz	
Multiturn potentiometer Teach button	Multiturn potentiometer	
X		
X		
X		
X	X	
X		
X		
X		
X		

Optical sensors

Photoel. sensors / diffuse sensors, cubic housing



15 series
Standard



25C series
Universal



Technical data	Dimensions without connector (W x H x D)	15 mm x 42.7 mm x 30 mm	15 mm x 42.7 mm x 30 mm
	Supply voltage U_B	10 ... 30 V, DC	10 ... 30 V, DC 12 ... 30 V, DC
	Interface		IO-Link
	Switching outputs	Transistor	Transistor
	Connection type	Cable Cable with connector, M12 Connector, M8 Connector, M12	Cable Cable with connector, M8 Cable with connector, M12 Cable with connector, Snap-in, M8 Connector, M8 Connector, M12
	Degree of protection	IP 67	IP 67 IP 69K
	Housing material	Plastic	Plastic
	Compatibility of materials		ECOLAB
	Ambient temperature, operation	-40 °C ... 60 °C	-40 °C ... 60 °C
Throughbeam photoelectric sensors	Min./max. operating range limit	0 m ... 30 m	0 m ... 400 m
	Light source	LED, Red	LED, Infrared LED, Red Power PinPoint® LED, Red
	Switching frequency	500 Hz	100 Hz ... 1,500 Hz
	Operational controls		270° potentiometer
Retro-reflective photoelectric sensors	Min./max. operating range limit	0 m ... 10 m	0 m ... 25 m
	Light source	LED, Red	Laser, Red LED, Red Power PinPoint® LED, Red
	Switching frequency	500 Hz	1,500 Hz ... 2,500 Hz
	Operational controls	270° potentiometer	270° potentiometer Multiturn potentiometer Teach button
Diffuse sensors with background suppression	Min./max. operating range limit	0.012 m ... 1 m	0 m ... 1.3 m
	Light source	LED, Infrared LED, Red	Laser, Red LED, Infrared LED, Red Power PinPoint® LED Power PinPoint® LED, Red
	Switching frequency	500 Hz	250 Hz ... 2,500 Hz
	Operational controls	Multiturn potentiometer	Multiturn potentiometer Teach button
Functions	Activation input		X
	Suppression of HF illumination (LED)		X
	Autocollimation		X
	Dynamic reference diffuse sensor		X
	Extra long light spot (XL)		X
	Small light spot (S)		X
	Teach input		X
	Tracking function		X
	Warning output		X

**33C series**

Stainless steel, Hygiene design

**35C series**

Stainless steel, Wash-Down design

**36 series**

Standard



18.8 mm x 52.8 mm x 32.4 mm	18.8 mm x 55.3 mm x 32.4 mm	20.5 mm x 76.3 mm x 44 mm
10 ... 30 V, DC 12 ... 30 V, DC	10 ... 30 V, DC 12 ... 30 V, DC	10 ... 30 V, DC
IO-Link	IO-Link	
Transistor	Transistor	Transistor
Connector, M8	Cable Cable with connector, M12 Connector, M12	Cable Cable with connector, M8 Cable with connector, M12 Connector, M12
IP 67 IP 68 IP 69K	IP 67 IP 68 IP 69K	IP 67
Stainless steel	Stainless steel	Plastic
CleanProof+ ECOLAB Johnson Diversey	CleanProof+ ECOLAB Johnson Diversey	
-40 °C ... 60 °C	-40 °C ... 60 °C	-40 °C ... 60 °C
0 m ... 400 m	0 m ... 400 m	0 m ... 100 m
LED, Infrared Power PinPoint® LED, Red	LED, Infrared Power PinPoint® LED, Red	LED, Red
100 Hz ... 1,500 Hz	100 Hz ... 1,500 Hz	300 Hz
270° potentiometer	270° potentiometer	270° potentiometer
0 m ... 25 m	0 m ... 25 m	0.3 m ... 21 m
Laser, Red Power PinPoint® LED, Red	Laser, Red Power PinPoint® LED, Red	LED, Red
1,500 Hz ... 2,500 Hz	1,500 Hz ... 2,500 Hz	300 Hz
270° potentiometer Multiturn potentiometer Teach button	270° potentiometer Multiturn potentiometer Teach button	
0 m ... 1.2 m	0 m ... 1.2 m	0.01 m ... 2.5 m
Laser, Red LED, Red Power PinPoint® LED, Red	Laser, Red LED, Red Power PinPoint® LED, Red	LED, Infrared LED, Red
300 Hz ... 2,500 Hz	300 Hz ... 2,500 Hz	250 Hz
Multiturn potentiometer Teach button	Multiturn potentiometer Teach button	Multiturn potentiometer
X	X	
X	X	
X	X	
X	X	
X	X	
X	X	

Optical sensors

Photoel. sensors / diffuse sensors,
cubic housing



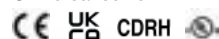
46C series

Universal, long range



49C series

Universal current



Technical data	Dimensions without connector (W x H x D)	20.5 mm x 76.3 mm x 44 mm	31 mm x 104 mm x 55.5 mm
	Supply voltage U_B	10 ... 30 V, DC	20 ... 250 V, AC/DC DC 10 ... 30 V, DC
	Interface	IO-Link	
	Switching outputs	Transistor	MOSFET semiconductor Relay Transistor
	Connection type	Cable Cable with connector, M12 Connector, M12	Cable Terminal
	Degree of protection	IP 67 IP 69K	IP 67
	Housing material	Plastic	Plastic
	Compatibility of materials	ECOLAB	
	Ambient temperature, operation	-40 °C ... 60 °C	-40 °C ... 60 °C
Throughbeam photoelectric sensors	Min./max. operating range limit	0 m ... 150 m	0 m ... 150 m
	Light source	LED, Infrared LED, Red	LED, Infrared LED, Red
	Switching frequency	500 Hz	25 Hz ... 500 Hz
	Operational controls	270° potentiometer	270° potentiometer Teach button
Retro-reflective photoelectric sensors	Min./max. operating range limit	0.1 m ... 30 m	0.1 m ... 30 m
	Light source	LED, Red	LED, Red
	Switching frequency	250 Hz ... 500 Hz	25 Hz ... 500 Hz
	Operational controls	270° potentiometer Teach button	270° potentiometer Teach button
Diffuse sensors with background suppression	Min./max. operating range limit	0.005 m ... 3 m	0.005 m ... 3 m
	Light source	Laser, Red LED, Infrared LED, Red	LED, Infrared LED, Red
	Switching frequency	100 Hz ... 1,000 Hz	25 Hz ... 250 Hz
	Operational controls	Multiturn potentiometer	Multiturn potentiometer Teach button
Functions	Activation input	X	X
	Autocollimation		
	Extra long light spot (XL)	X	
	Small light spot (S)	X	
	Teach input		
	Tracking function		
	Warning output	X	X

**53C series**

Stainless steel, Hygiene design

**55C series**

Stainless steel, Wash-Down design

**18B series**

Metal, detection of transparent objects



14 mm x 35.4 mm x 20.4 mm	14 mm x 35.4 mm x 25 mm	15 mm x 47 mm x 32.5 mm
10 ... 30 V, DC 12 ... 30 V, DC	10 ... 30 V, DC	10 ... 30 V, DC
IO-Link	IO-Link	IO-Link
Transistor	Transistor	Transistor
Cable Connector, M8	Cable Cable with connector, M12 Connector, M8	Cable Connector, M12
IP 67 IP 68 IP 69K	IP 67 IP 68 IP 69K	IP 67 IP 69K
Stainless steel	Stainless steel	Metal
CleanProof+ ECOLAB Johnson Diversey	CleanProof+ ECOLAB Johnson Diversey	ECOLAB
-40 °C ... 60 °C	-40 °C ... 60 °C	-40 °C ... 60 °C
0.05 m ... 10 m	0 m ... 80 m	
LED, Red	LED, Infrared LED, Red	
1,000 Hz	350 Hz ... 1,000 Hz	
0 m ... 5 m	0 m ... 6 m	0 m ... 7.2 m
Laser, Red LED, Red	Laser, Red LED, Red	LED, Red
1,500 Hz ... 3,000 Hz	1,500 Hz ... 3,000 Hz	500 Hz ... 5,000 Hz
Teach button	Teach button	270° potentiometer Multiturn potentiometer Teach button
0.005 m ... 0.45 m	0.005 m ... 0.6 m	
Laser, Red LED, Red	Laser, Red LED, Infrared LED, Red	
750 Hz ... 3,000 Hz	750 Hz ... 3,000 Hz	
Multiturn potentiometer Teach button	Multiturn potentiometer Teach button	
X	X	
X	X	X
X	X	
X	X	
X	X	
X	X	
X	X	X

Optical sensors

Photoel. sensors / diffuse sensors,
cubic housing



8 series
Metal



96 series
Metal, long range



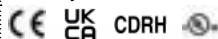
Technical data	Dimensions without connector (W x H x D)	15 mm x 48 mm x 38 mm	30 mm x 90 mm x 70 mm
	Supply voltage U_B	10 ... 30 V, DC	10 ... 30 V, DC 18 ... 30 V, DC 20 ... 230 V, AC/DC
	Switching outputs	Transistor	Relay Transistor
	Connection type	Cable Connector, M12	Connector, M12 Terminal
	Degree of protection	IP 67 IP 69K	IP 67 IP 69K
	Housing material	Metal	Metal
	Compatibility of materials	ECOLAB	ECOLAB
	Ambient temperature, operation	-40 °C ... 60 °C	-40 °C ... 60 °C
Throughbeam photoelectric sensors	Min./max. operating range limit	0 m ... 100 m	0 m ... 150 m
	Light source	Laser, Red LED, Red	LED, Infrared LED, Red
	Switching frequency	1,500 Hz ... 2,800 Hz	20 Hz ... 500 Hz
	Operational controls	Multiturn potentiometer	270° potentiometer
Retro-reflective photoelectric sensors	Min./max. operating range limit	0 m ... 21 m	0 m ... 18 m
	Light source	Laser, Red LED, Red	LED, Red
	Switching frequency	1,000 Hz ... 2,800 Hz	20 Hz ... 1,000 Hz
	Operational controls	Multiturn potentiometer	270° potentiometer Multiturn potentiometer
Diffuse sensors with background suppression	Min./max. operating range limit	0.007 m ... 0.4 m	0.05 m ... 30 m
	Light source	Laser, Red LED, Infrared LED, Red	Laser, Infrared Laser, Red LED, Infrared LED, Red
	Switching frequency	200 Hz ... 2,000 Hz	10 Hz ... 300 Hz
	Operational controls	Multiturn potentiometer	Multiturn potentiometer Teach button
Functions	Activation input		X
	Autocollimation	X	
	Small light spot (S)		X
	Teach input	X	
	Tracking function	X	
	Warning output	X	X

Optical sensors

Photoel. sensors / diffuse sensors,
cylindrical housing



318(B) series, 328 series
M18, cylindrical



412B series
M12, cylindrical



Technical data	Thread size	M18	M12
	Length	46 mm ... 61 mm	51 mm ... 60 mm
	Supply voltage U_B	10 ... 30 V, DC	10 ... 36 V, DC
	Switching outputs	Transistor	Transistor
	Connection type	Cable Cable with connector, M12 Connector, M12	Cable Connector, M12
	Degree of protection	IP 67	IP 67
	Housing material	Plastic Stainless steel	Metal Stainless steel
	Ambient temperature, operation	-40 °C ... 65 °C	-25 °C ... 55 °C
Throughbeam photoelectric sensors	Min./max. operating range limit	0 m ... 23 m	0 m ... 50 m
	Light source	LED, Infrared LED, Red	Laser, Red LED, Red
	Switching frequency	500 Hz	1,000 Hz ... 5,000 Hz
	Operational controls		270° potentiometer
Retro-reflective photoelectric sensors	Min./max. operating range limit	0.02 m ... 6 m	0.02 m ... 2.3 m
	Light source	LED, Red	LED, Red
	Switching frequency	500 Hz	1,000 Hz
	Operational controls	Teach button	
Energetic diffuse sensor	Min./max. operating range limit	0.001 m ... 1 m	0.004 m ... 0.66 m
	Light source	LED, Infrared LED, Red	LED, Red
	Switching frequency	500 Hz	1,000 Hz
	Operational controls	Teach button	270° potentiometer
Diffuse sensors with background suppression	Min./max. operating range limit	0.001 m ... 0.14 m	
	Light source	LED, Red	
	Switching frequency	1,000 Hz	
	Operational controls	270° potentiometer	
Functions	Small light spot (S)	X	

Optical sensors

Long-range sensors

NEW

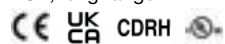


ODT 3C
TOF, long range
CE UK CA CDRH

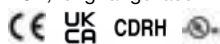
Technical data	Dimensions without connector (W x H x D)	11.4 mm x 34.2 mm x 18.3 mm
	Supply voltage U _B	10 ... 30 V, DC 12 ... 30 V, DC
	Interface	IO-Link
	Switching outputs	Transistor
	Connection type	Cable Cable with connector, M8 Cable with connector, M12 Connector, M8
	Degree of protection	IP 67 IP 69K
	Housing material	Plastic
	Compatibility of materials	ECOLAB
	Ambient temperature, operation	-40 °C ... 60 °C
Diffuse sensors with background suppression	Min./max. operating range limit	0.01 m ... 2 m
	Light source	Laser, Red LED, Red
	Switching frequency	7 Hz ... 750 Hz
	Operational controls	Teach button
Func-tions	Teach input	

**25 LR series**

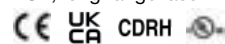
TOF, long range

**110 series**

TOF, long range laser

**10 series**

TOF, long range laser



15 mm x 38.9 mm x 28.7 mm	23 mm x 50 mm x 50 mm	25 mm x 65 mm x 55 mm
18 ... 30 V, DC	18 ... 30 V, DC	18 ... 30 V, DC
IO-Link	IO-Link	IO-Link
Transistor	Transistor	Transistor
Cable Cable with connector, M12 Connector, M12	Connector, M12	Cable Cable with connector, M12 Connector, M12
IP 66 IP 67	IP 67 IP 69K	IP 67
Plastic	Plastic	Plastic
-30 °C ... 50 °C	-40 °C ... 60 °C	-40 °C ... 50 °C
0.05 m ... 3 m	0 m ... 5 m	0.05 m ... 25 m
LED, Infrared	Laser, Red	Laser, Red
2 Hz ... 30 Hz	500 Hz	40 Hz
Teach button	Control buttons PC software	Membrane keyboard
X		X

Inductive switches

Inductive switches, cylindrical

NEW



IS D08, D12, D18, D30



IS 203, 204, 205, 206
Miniature sensors, cylindrical housing



Technical data	Diameter	8 mm 12 mm 18 mm 30 mm	3 mm 4 mm 5 mm 6.5 mm
	Thread size	M8 M12 M18 M30	M5
	Type of installation	Embedded/flush Non-embedded/non-flush	Embedded/flush
	Supply voltage U _B	10 ... 30 V, DC	10 ... 30 V, DC
	type. operating range limit S _n	2 mm ... 30 mm	1 mm ... 3 mm
	Switching outputs	NPN PNP	PNP
	Switching principle	NC (normally closed) NO (normally open)	NC (normally closed) NO (normally open)
	Switching frequency, max.	1,500 Hz	5,000 Hz
	Connection type	Cable Connector, M8 Connector, M12 M12	Cable Cable with connector, M8 Connector, M8
	Degree of protection	IP 67	IP 67
	Housing	Metal Stainless steel	Metal Stainless steel
	Active surface	Plastic	Plastic
	Features	Optimized price-performance ratio Robust bend protection Single and double scanning range	Also available with increased operating range Cylindrical miniature housing Housing made of stainless steel (V2A)



IS 208, 212, 218, 230
Standard, cylindrical



IS 208, 212, 218, 230
All stainless steel



IS 212, 218, 230
AC/DC - sensors



8 mm 12 mm 18 mm 30 mm	8 mm 12 mm 18 mm 30 mm	12 mm 18 mm 30 mm
M8 M12 M18 M30	M8 M12 M18 M30	M12 M18 M30
Embedded/flush Non-embedded/non-flush	Embedded/flush Non-embedded/non-flush	Embedded/flush Non-embedded/non-flush
10 ... 30 V, DC 10 ... 36 V, DC	10 ... 30 V, DC	10 ... 320 V, AC/DC
1.5 mm ... 40 mm	2 mm ... 40 mm	2 mm ... 15 mm
NPN PNP	NPN PNP	
NC (normally closed) NC contact – Antivalent NO (normally open) NO contact – Antivalent	NC (normally closed) NO (normally open)	NC (normally closed) NO (normally open)
5,000 Hz	600 Hz	3,000 Hz
Cable Cable with connector, M8 Cable with connector, M12 Connector, M8 Connector, M12	Cable Connector, M8 Connector, M12	Cable
IP 67	IP 68 IP 69K	IP 67
Metal Stainless steel	Stainless steel	Metal
Plastic	Stainless steel	Plastic
Also available with increased operating range Antivalent switching outputs (NO+NC) Increased range Models with short housing design	Also available as a model with 316L stainless steel (ECOLAB) suitable for use in hygienic applications Correction factor 1 (material-independent detection) Full stainless steel housing from a single piece (V2A & V4A) Mechanically resistant against impacts on the active surface Resistant against vibration and pressure shocks	

Inductive switches

Inductive switches, cubic



IS 255, 288
Miniature sensors, cubic housing
CE UK CA



IS 240, 244 / ISS 244
Standard, cubic
CE UK CA

Technical data	Dimension (W x H x L)	5 mm x 5 mm x 25 mm 8 mm x 8 mm x 40 mm 8 mm x 8 mm x 59 mm	12 mm x 40 mm x 26 mm 40 mm x 40 mm x 66 mm 40 mm x 40 mm x 67 mm 40 mm x 40 mm x 118 mm
	Type of installation	Embedded/flush	Embedded/flush Non-embedded/non-flush
	Supply voltage U _B	10 ... 30 V, DC	10 ... 30 V, DC
	type. operating range limit S _n	1.5 mm ... 3 mm	4 mm ... 40 mm
	Switching outputs	NPN PNP	NPN PNP
	Switching principle	NC (normally closed) NO (normally open)	NC contact – Antivalent NO (normally open) NO contact – Antivalent
	Switching frequency, max.	5,000 Hz	1,400 Hz
	Connection type	Cable Cable with connector, M8 Connector, M8	Cable Connector, M8 Connector, M12 Terminal
	Degree of protection	IP 67	IP 67 IP 68 IP 69K
	Housing	Metal	Plastic
	Features	Also available with increased operating range Cubic miniature housing	360° visibility through 4-way LED indicator on the sensor head Antivalent switching outputs (NO+NC) Bright status display Increased range M12 plug, turnable 270° and thus suitable even for angled connection cables

Capacitive sensors

Capacitive sensors, cubic

NEW



LCS-1



LCS-2



Technical data	Dimension (W x H x L)	40 mm x 40 mm x 10 mm 54 mm x 20.3 mm x 5.5 mm	50 mm x 20 mm x 5.5 mm
	Type of installation	Embedded/flush	Embedded/flush Non-embedded/non-flush
	Supply voltage U_B	10 V DC ... 30 V DC	10 V DC ... 30 V DC
	Typ. operating range limit S_n	1 mm ... 20 mm	1 mm ... 10 mm
	Switching outputs	NPN PNP Push-pull	NPN PNP
	Switching principle	NC (normally closed) NO (normally open) Normally closed contact (NC)/normally open contact (NO)	NC (normally closed) NO (normally open)
	Switching frequency	100 Hz	100 Hz
	Connection type	Cable Connector, M8	Cable
	Degree of protection	IP 67	IP 65
	Operational controls	Multiturn potentiometer (11 turns) Multiturn potentiometer (20 turns)	Multiturn potentiometer (12 turns)
	Housing	Plastic	Plastic
	Features	Compact and flat design Switching distances adjustable by means of potentiometer	Compact and flat design Switching distances adjustable by means of potentiometer

Capacitive sensors

Capacitive sensors, cylindrical



LCS-1

LCS-2



Technical data	Thread size	M12 M18 M30	M12 M18 M30
	Type of installation	Embedded/flush Non-embedded/non-flush	Embedded/flush Non-embedded/non-flush
	Supply voltage U _B	10 V DC ... 30 V DC	10 V DC ... 30 V DC
	Typ. operating range limit S _n	1 mm ... 25 mm	1 mm ... 30 mm
	Switching outputs	NPN PNP	NPN PNP
	Switching principle	NC (normally closed) NO (normally open) Normally closed contact (NC)/normally open contact (NO), programmable	NC (normally closed) NO (normally open)
	Interface	IO-Link	
	Switching frequency	100 Hz	100 Hz
	Connection type	Cable Connector, M12	Cable Connector, M12
	Degree of protection	IP 67	IP 67
	Operational controls	Multiturn potentiometer (12 turns) Multiturn potentiometer (20 turns) Teach button	Multiturn potentiometer
	Housing	Metal Plastic Stainless steel	Metal Plastic
	Features	Analog and IO-Link interfaces Models with chemical-resistant PTFE housing Switching distances adjustable by means of potentiometer or teach button	Switching distances adjustable by means of potentiometer

Fiber optic sensors

Fiber optic amplifiers



LV46x



Technical data	Dimensions without connector (W x H x D)	10 mm x 31 mm x 62 mm 10 mm x 31.5 mm x 72 mm 10 mm x 33 mm x 79.4 mm
	Supply voltage U_B	10 V DC ... 24 V DC
	Switching frequency	250 Hz ... 50,000 Hz
	Connection type	Cable Cable with connector, M8 Cable with connector, M12 Connector, M8
	Degree of protection	IP 50 NEMA 1
	Interface	IO-Link
	Switching outputs	NPN PNP Push-pull
	Switching principle	Dark switching IO-Link / light switching (PNP)/dark switching (NPN) Light/dark switchable Light switching
	Analog outputs	Current Voltage
	Selectable inputs/outputs	Activation input Multiplex operation Teach input
	Light source	LED, Infrared LED, Red
	Operational controls	Control buttons Multiturn potentiometer Rocker pressure switch Slide switch
	Housing	Plastic
Features	Special version	Large operating range Short response time Time function

Fiber optic sensors

Fiber optics



GF

Glass fiber optics



KF

Plastic fiber optics

Technical data	Operating principle	Diffuse reflection principle Throughbeam principle	Diffuse reflection principle Throughbeam principle
	Design	Cylindrical	Cubic Cylindrical
	Outer diameter	2.9 mm ... 7 mm	1 mm ... 4 mm
	Fiber length	200 mm ... 5,000 mm	210 mm ... 5,000 mm
	Fiber sheathing	Nickel-plated brass Silicone Stainless steel Stainless steel (SUS303)	PE PTFE
	Fiber head	Aluminum Stainless steel Stainless steel (SUS303)	Metal Plastic Stainless steel Zinc
	Light beam exit	bent 90° Front Lateral with lens Lateral without lens On face	bent 90° Front Lateral
	Laying	standard	Flexible Highly flexible standard
	Smallest bending radius	R23 R40	R1 R2 R10 R15 R25 R60
Features	Area of application	General applications Oil and chemical resistant	General applications Highly precise object detection Oil and chemical resistant Precise object detection
	Ambient temperature, operation	-40 °C ... 300 °C	-55 °C ... 105 °C
	Special version	Heat resistant Robust bend protection	Area detection Heat resistant Robust bend protection V-optics

Ultrasonic sensors

Ultrasonic sensors, cubic



18 series



NEW



420B series



Technical data	Dimensions without connector (W x H x D)	15 mm x 50 mm x 33 mm	20.5 mm x 41 mm x 15 mm
	Supply voltage U_B	10 V DC ... 30 V DC	12 V DC ... 30 V DC
	Switching outputs	NPN PNP	Push-pull
	Interface		IO-Link
	Connection type	Connector, M12	Connector, M8
	Degree of protection	IP 65	IP 67
	Operational controls	Step switch	Teach button
	Housing	Metal	Plastic
Through-beam principle	Operating range	0 m ... 0.65 m	
	Switching frequency	100 Hz	
	Switching principle	NO (normally open)	
	Ultrasonic frequency	300 kHz	
Diffuse reflection principle with back-ground suppression	Operating range		0.01 m ... 1 m
	Switching frequency		8 Hz ... 20 Hz
	Switching principle		Dark switching (PNP)/light switching (NPN) IO-Link / light switching (PNP)/dark switching (NPN) Light switching (PNP)/dark switching (NPN)
	Teach inputs		1 Piece(s)
	Ultrasonic frequency		220 kHz ... 370 kHz
Features	Special version		Multiplex operation Synchronous operation Teach input

Ultrasonic sensors

Technical data	Thread size
	Length
	Supply voltage U_B
	Switching outputs
	Interface
	Connection type
	Degree of protection
	Operational controls
	Housing
Reflection principle	Operating range
	Switching frequency
	Switching principle
	Teach inputs
	Ultrasonic frequency
Diffuse reflection principle with background suppression	Operating range
	Switching frequency
	Switching principle
	Inputs/outputs
	Teach inputs
	Ultrasonic frequency
Features	Special version

Ultrasonic sensors, cylindrical



200 series



M8 M12 M18 M30
55 mm ... 78 mm
18 V DC ... 30 V DC
NPN PNP Push-pull
IO-Link
Connector, M8 Connector, M12
IP 67
Metal
0 m ... 1.6 m
1 Hz ... 8 Hz
NO (normally open)
1 Piece(s)
230 kHz ... 300 kHz
0.02 m ... 6 m
2 Hz ... 20 Hz
Dark switching IO-Link / light switching (PNP)/dark switching (NPN) Light switching
1 Piece(s)
80 kHz ... 484 kHz
Teach input

300 series



M18 M30
60.3 mm ... 98.8 mm
10 V DC ... 30 V DC
NPN PNP
Connector, M12
IP 67
Control buttons
Plastic
0 m ... 1.6 m
1 Hz ... 8 Hz
NO (normally open)
1 Piece(s)
230 kHz ... 300 kHz
0.04 m ... 6 m
2 Hz ... 10 Hz
NC (normally closed) NO (normally open)
1 Piece(s)
1 Piece(s)
75 kHz ... 300 kHz
2 independent switching outputs Multiplex operation Synchronous operation Teach input

400 series



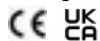
M12 M18 M30
50 mm ... 104.3 mm
12 V DC ... 30 V DC
PNP Push-pull
IO-Link
Connector, M12
IP 67 IP 68
Control buttons
Metal
0.015 m ... 6 m
1.6 Hz ... 12 Hz
IO-Link / light switching (PNP)/dark switching (NPN) IO-Link / NC contact/NO contact Light switching (PNP)/dark switching (NPN) NC (normally closed) NC contact/NO contact NO (normally open)
1 Piece(s)
1 Piece(s)
75 kHz ... 310 kHz
2 independent switching outputs Multiplex operation Synchronous operation Teach input

Light curtains

Technical data	Application
	Profile cross section
	Measurement field length
	Beam spacing
	Number of beams
	Minimum object diameter
	Operating range
	Interface
	Supply voltage U _B
	Connection type
	Degree of protection
	Light source
	Housing
	Cycle time
	Response time per beam
	Operational controls
	Type of configuration
	Ambient temperature, operation
	Type of display
Features	Diagonal-beam scanning
	Crossed-beam scanning
	Parallel-beam scanning

**CSL 505**

Throughbeam principle, narrow design

**CSL 710**

Throughbeam principle, standard design

**CSR 780**

Reflection principle



Precise object detection	Precise object detection	Ejection monitoring on machines Precise object detection
10 mm x 27 mm 12 mm x 58 mm	29 mm x 35.4 mm 29 mm x 54.8 mm 30.4 mm x 40.3 mm 30.4 mm x 54.8 mm	34.2 mm x 28.6 mm
35 mm ... 3,150 mm	150 mm ... 2,960 mm	96 mm ... 432 mm
5 mm 12.5 mm 25 mm 50 mm 100 mm	5 mm 10 mm 20 mm 40 mm	1 mm
8 Piece(s) ... 96 Piece(s)	8 Piece(s) ... 592 Piece(s)	
7.5 mm ... 102.5 mm	10 mm ... 50 mm	1 mm
0.3 m ... 6.5 m	0.1 m ... 7 m	0 m ... 0.7 m
	IO-Link	
18 V DC ... 30 V DC	18 V DC ... 30 V DC	18 V DC ... 30 V DC
Connector, M8	Connector, M12	Connector, M12
IP 65	IP 65 IP 67	IP 65
LED, Infrared	LED, Infrared	LED, Infrared
Metal	Metal	Metal
12 ms ... 100 ms	1 ms ... 82 ms	
1,000 µs	30 µs	
	Membrane keyboard	Teach button
Software Via pin assignment	Software Teach-in	
-30 ... 50 °C	-30 ... 60 °C	0 ... 55 °C
LED	LED OLED display	LED
X	X	
X	X	
X	X	

Laser scanners

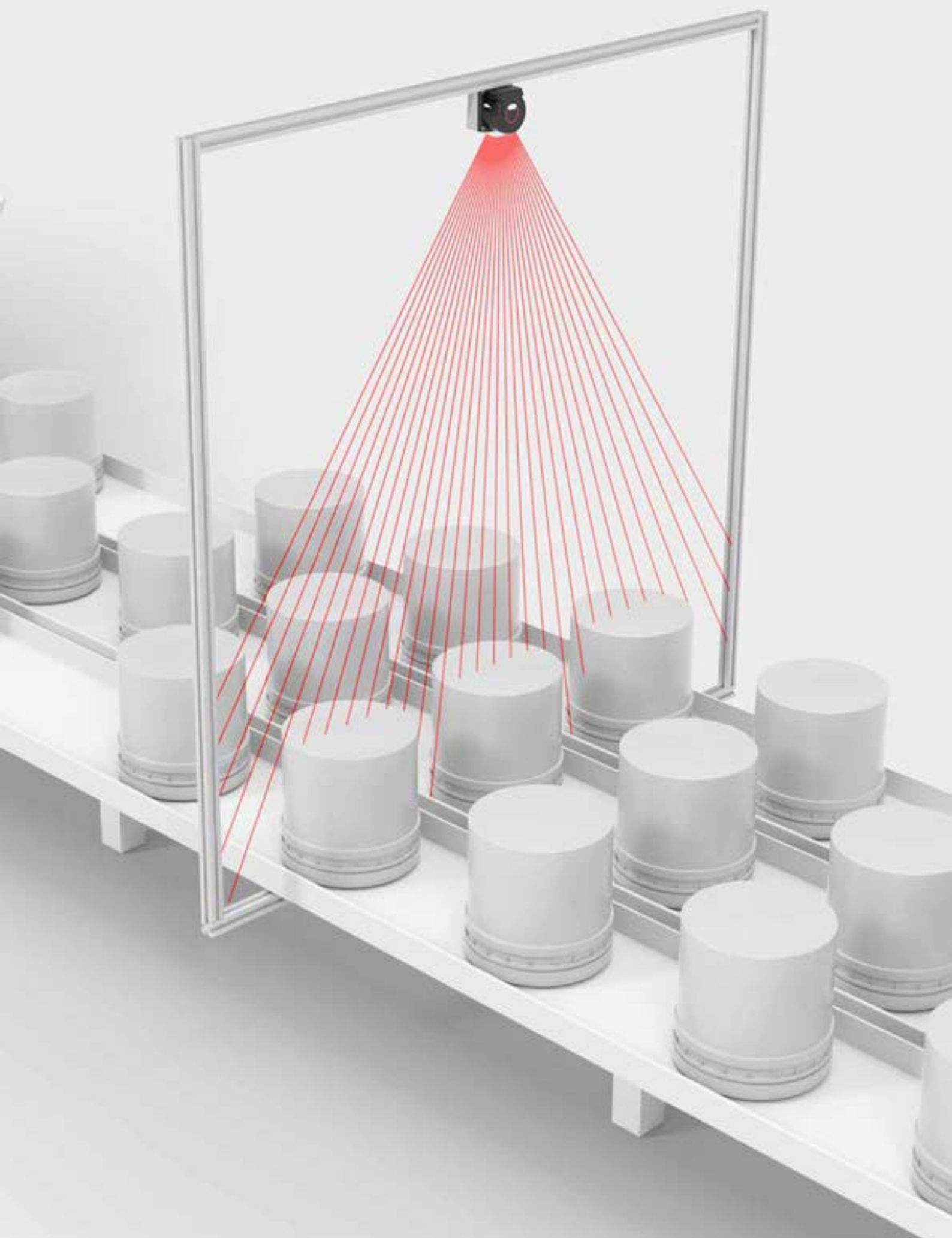
NEW



ROD 100

CE CDRH

Technical data	Application	Collision avoidance Completeness check Overhang control
	Detection range	0.08 ... 25 m Diffuse reflection > 90% 7 m at 1.8 % reflection 15 m at 10 % reflection 25 m at 90 % reflection
	Number of field sets	16 field triple zones can be configured
	Systematic error	± 10 mm
	Statistical error (1σ)	≤5 mm (0.08 – 7 m) ≤10 mm (7 – 15 m) ≤6 mm (0.08 – 25 m) for reflectors
	Detection angle	275 °
	Angular resolution	0.2° at 80 Hz
	Interface	Ethernet for configuration
	Light source	Laser, Infrared, 905 nm
	Laser class in accordance with IEC/EN 60825-1	1
	Digital switching outputs	5 Piece(s) PNP, Max. 30 V DC / 50 mA
	Digital switching inputs	4 Piece(s) PNP, 3.5 mA / 24 V
	Connection	Connector, M12
	Dimensions without connector (W x H x D)	80 mm x 80 mm x 85 mm
	Housing material	Diecast zinc
	Lens cover material	Plastic
	Ambient temperature, operation	-30 ... 60 °C
	Degree of protection	IP 67
Features	Type of configuration	Software ROD configurator



Fork sensors

Label detection



GS 61
Label detection, optical
CE UK CA



GS 63B
Label detection, optical
CE UK CA

Technical data	Application	Detection of non-transparent labels	Detection of non-transparent labels
	Principle of physics	Optical	Optical
	Interface		
	Switching outputs	Push-pull	Push-pull
	Switching frequency	10,000 Hz	10,000 Hz
	Response time	0.05 ms	0.05 ms
	Operational controls	Multiturn potentiometer Teach button	Multiturn potentiometer Teach button
	Mouth width	3 mm	3 mm
	Mouth depth	41 mm	61 mm
	Dimensions without connector (W x H x D)	11 mm x 30 mm x 60 mm	11 mm x 30 mm x 80 mm
	Supply voltage U _B	10 V DC ... 30 V DC	10 V DC ... 30 V DC
	Connection type	Cable Cable with connector, M12 Connector, M8	Cable Cable with connector, M8 Cable with connector, M12 Connector, M8
	Plug outlet	Horizontal (parallel to belt movement) Vertical (perpendicular to belt movement)	Horizontal (parallel to belt movement) Vertical (perpendicular to belt movement)
	Degree of protection	IP 65	IP 67
	Housing	Plastic	Metal Plastic
Features	Special version	Teach input	Article set Teach input Warning output

**GSU 12**

Label detection, ultrasonics

**(!)GSU 14E**

Label detection, ultrasonics

**GSX 14E**

Label detection, ultrasonics, optical



Detection of non-transparent labels Detection of transparent labels	Detection of non-transparent labels Detection of transparent labels	Detection of non-transparent labels Detection of transparent labels
Ultrasonics	Ultrasonics	optical and ultrasonics
	IO-Link	IO-Link
Push-pull	Push-pull	Push-pull
1,750 Hz	2,000 Hz	2,000 Hz
0.24 ms	0.2 ms	0.2 ms
Teach button	Control buttons	Control buttons
4 mm	4 mm	4 mm
80 mm	80 mm	80 mm
22 mm x 46.9 mm x 96 mm	22 mm x 46.9 mm x 96 mm	22 mm x 46.9 mm x 96 mm
12 V DC ... 30 V DC	18 V DC ... 30 V DC	18 V DC ... 30 V DC
Connector, M8 Connector, M12	Connector, M12	Connector, M12
Horizontal (parallel to belt movement)	Horizontal (parallel to belt movement) Vertical (perpendicular to belt movement)	Horizontal (parallel to belt movement) Vertical (perpendicular to belt movement)
IP 65	IP 65	IP 65
Metal	Metal	Metal
	ALC function (tracking) easyTeach function Manual fine tuning of the switching threshold Teach input Warning output	ALC function (tracking) easyTeach function Manual fine tuning of the switching threshold Teach input Warning output

Fork sensors

Label detection



GK 14
Label detection, capacitive
CE UK CA

Technical data	Application	Detection of non-transparent labels Detection of transparent labels
	Principle of physics	Capacitive
	Switching outputs	NPN PNP
	Switching frequency	5,000 Hz
	Response time	0.1 ms
	Operational controls	Multiturn potentiometer
	Mouth width	1 mm
	Mouth depth	85 mm
	Dimensions without connector (W x H x D)	24 mm x 36.5 mm x 110 mm
	Supply voltage U _B	10 V DC ... 30 V DC
	Connection type	Connector, M12
	Plug outlet	Horizontal (parallel to belt movement) Vertical (perpendicular to belt movement)
	Degree of protection	IP 65
	Housing	Metal

Fork sensors

Object detection



GS 04B

Object detection, optical



GS 08B

Object detection, optical



Technical data	Application	Detection of small parts	Detection of small parts
	Switching outputs	NPN PNP Push-pull	Push-pull
	Interface	IO-Link	IO-Link
	Switching frequency	5,000 Hz ... 10,000 Hz	5,000 Hz
	Response time	0.05 ms ... 0.1 ms	0.1 ms
	Operational controls	270° potentiometer	270° potentiometer
	Light source	Laser, Red LED, Infrared LED, Red	Laser, Red LED, Red
	Mouth width	5 mm 10 mm 20 mm 30 mm 40 mm 50 mm 60 mm 70 mm 80 mm 90 mm 100 mm 120 mm 170 mm 220 mm	30 mm 50 mm 80 mm 120 mm
	Mouth depth	17 mm 25 mm 35 mm 45 mm 55 mm 60 mm 110 mm	35 mm 55 mm 60 mm
	Supply voltage U _B	10 V DC ... 30 V DC	10 V DC ... 30 V DC
	Connection type	Connector, M8	Connector, M8
	Degree of protection	IP 67	IP 67
	Housing	Metal	Stainless steel

Luminescence sensors



LRT 8



Technical data	Application	Detection of any kind of luminescence Detection of red marks on wood Detection of white paper Detection of yellow print marks
	Dimensions without connector (W x H x D)	15 mm x 48 mm x 38 mm
	Operating range limit	0 m ... 0.5 m
	Supply voltage U _B	10 V DC ... 30 V DC
	Switching outputs	NPN PNP
	Switching inputs	L/D switching
	Connection type	Connector, M12
	Degree of protection	IP 67
	Switching frequency	1,500 Hz
	Light source	LED, Blue LED, UV
	Compatibility of materials	ECOLAB
	Housing	Metal
	Operational controls	Multiturn potentiometer
Features	Special version	Autocollimation



Contrast sensors



KRT 18B



KRT 3C



Technical data	Dimensions without connector (W x H x D)	15 mm x 47 mm x 32.5 mm	11.4 mm x 34.2 mm x 18.3 mm
	Supply voltage U_B	12 V DC ... 30 V DC	12 V DC ... 30 V DC
	Operating range	13 mm $\pm$ 3 mm	14.5 mm $\pm$ 2mm 60 mm $\pm$ 20mm
	Interface	IO-Link	IO-Link
	Switching outputs	Analog output, Current Analog output, Voltage Transistor, Push-pull	Transistor, NPN Transistor, PNP Transistor, Push-pull
	Connection type	Connector, M12	Cable Cable with connector, M8 Cable with connector, M12 Connector, M8
	Degree of protection	IP 67 IP 69K	IP 67 IP 69K
	Light source	LED, RGB LED, White	Laser, Red LED, RGB LED, White
	Light spot orientation	Horizontal Vertical	Horizontal Vertical
	Light beam exit	Front	Front
	Light spot shape	Rectangular	Oval Rectangular
	Switching frequency	15,000 Hz ... 22,000 Hz	4,000 Hz ... 10,000 Hz
	Operational controls	Button(s) Multiturn potentiometer Teach button	Teach button
	Housing	Metal	Plastic
	Compatibility of materials	ECOLAB	ECOLAB
Functions	Autocollimation		
	Short response time	X	
	Crop mark system		
	Synchronization input		
	Teach input	X	X
	Tracking for automatic signal tracking	X	
	Time function		X

**KRT 55****KRT 20****KRT 21**

14 mm x 35.5 mm x 25 mm	30 mm x 80 mm x 53 mm	31 mm x 53 mm x 80.1 mm
10 V DC ... 30 V DC	12 V DC ... 30 V DC	10 V DC ... 30 V DC
13 mm ± 2 mm	12 mm ±1mm 20 mm ±2mm 50 mm ±5mm	9 mm ± 3 mm
Transistor, PNP	Analog output, Current Transistor, NPN Transistor, PNP	Transistor, NPN Transistor, PNP
Cable Cable with connector, M12 Connector, M8	Connector, M12	Connector, M12
IP 67 IP 69K	IP 67 IP 69K	IP 67
LED, RGB LED, White	LED, RGB	LED, RGB
Vertical	in center Vertical	Vertical
Front	On face	On face
Rectangular	Rectangular Round	Rectangular
10,000 Hz	16,000 Hz ... 50,000 Hz	15,000 Hz
Teach button	Membrane keyboard Via service interface	Teach button
Stainless steel	Metal	Plastic
CleanProof+ ECOLAB		
	X	
	X	
	X	
X		
X	X	X

Color sensors



NEW

CRT 448



CRT 648



Technical data	Application	Detection of three colors	Detection of one color Detection of up to 7 colors
	Dimensions without connector (W x H x D)	17 mm x 50 mm x 50 mm	25 mm x 50 mm x 50.5 mm
	Supply voltage U _B	12 V DC ... 28 V DC	18 V DC ... 30 V DC
	Operating range	12 mm ... 32 mm	18 mm ... 150 mm
	Interface		IO-Link
	Switching outputs	NPN PNP	PNP / NPN switchable Push-pull
	Teach inputs	1 Piece(s)	1 Piece(s)
	Connection type	Connector, M12	Connector, turning 270°, M12
	Degree of protection	IP 67	IP 67 IP 69
	Light source	LED, White	LED, White
	Light spot shape		Rectangular
	Switching frequency	500 Hz	3 Hz ... 3,000 Hz
Features	Housing	Plastic	Metal
	Operational controls		Control buttons
Features	Special version	3 switching outputs Synchronization input	For glossy objects (not suitable for black objects) RGB color output via IO-Link Teach input (configurable sync / key lock)

Double sheet monitoring / splice detection



DB 12B, 112B, 14B
Double sheet monitoring



VSU 12/IGSU 14E
Splice detection



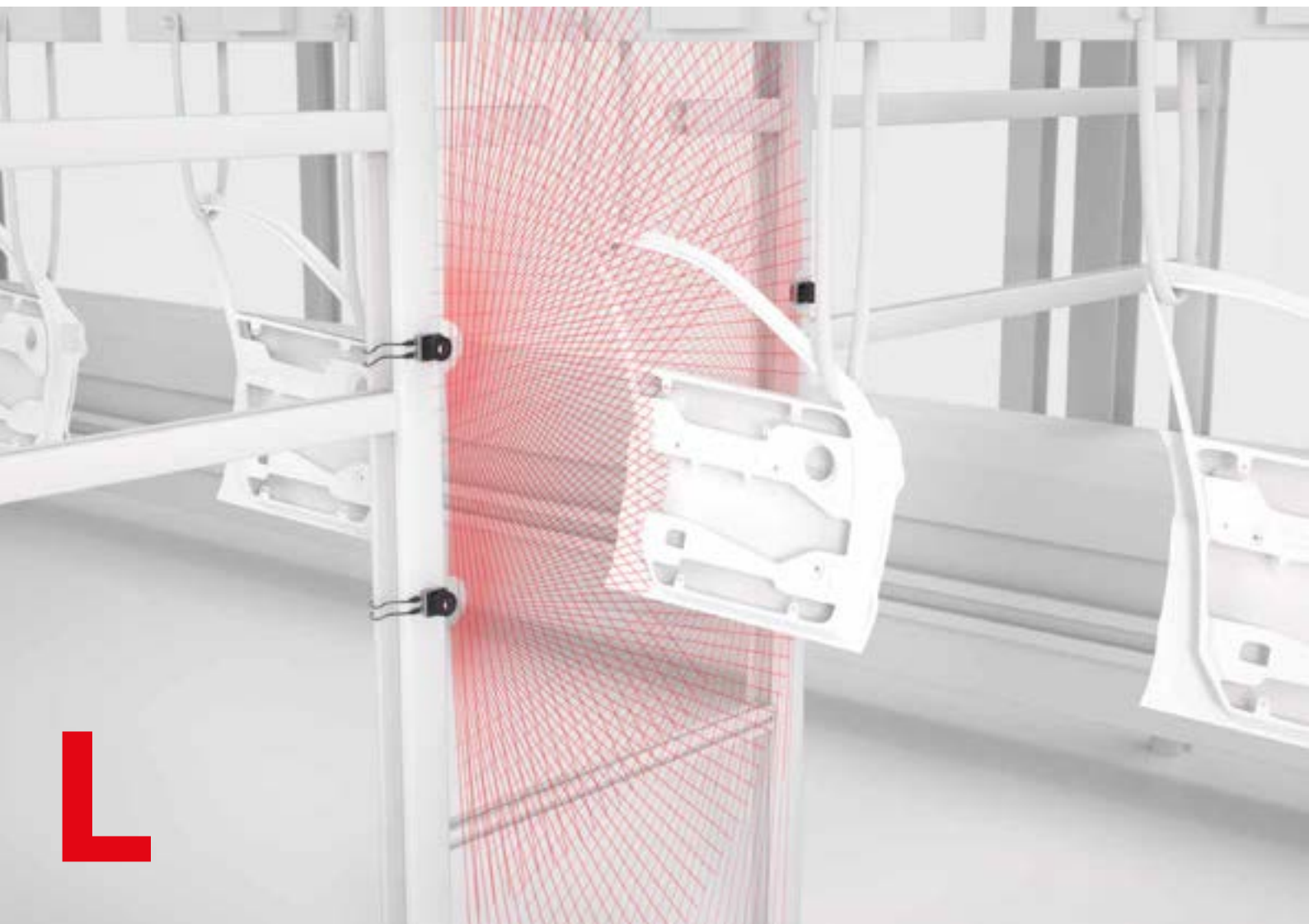
Technical data	Application	Double sheet monitoring	Splice inspections
	Principle of physics	Capacitive Ultrasonics	Ultrasonics
	Medium		Transparent and not transparent
	Operating range	0.006 m ... 0.03 m	
	Mouth depth		80 mm
	Mouth width		4 mm
	Design	Cubic Cylindrical	Cubic Fork
	Interface		IO-Link
	Digital switching outputs	2 Piece(s) ... 7 Piece(s)	2 Piece(s)
	Analog outputs	1 Piece(s)	
	Switching inputs	1 Piece(s) ... 2 Piece(s)	
	Teach inputs	1 Piece(s)	1 Piece(s)
	Supply voltage U_B	18 V DC ... 30 V DC	10 V DC ... 30 V DC
	Switching frequency	200 Hz	200 Hz ... 2,000 Hz
Features	Degree of protection	IP 54 IP 65	IP 65
	Ambient temperature, operation	0 °C ... 50 °C	0 °C ... 60 °C
Features	Housing material	Metal	Metal
	Special version		easyTeach function Integrated paper tear monitoring Manual fine tuning of the switching threshold Teach input Warning output

Measuring sensors

Intelligent test and control through measuring sensors

Measuring sensors can actively check distances, calculate absolute distances for the positioning of axes in plant construction and monitor other parameters in order to intelligently and independently initiate actions and, e.g., intervene in processes for control purposes.

We offer a large selection of different sensor technologies and designs that you can use to find solutions to measuring applications. Various powerful technologies facilitate optimum adaptation of our measuring sensors to a wide range of application requirements. Depending on the application, various communication interfaces are also available, such as IO-Link, bus interfaces or Ethernet-based interfaces.





Contour measurement and navigation with laser scanners for efficient manufacturing and logistics processes

The new laser scanners in the ROD 300 series for contour measurement and the ROD 500 as a high-resolution variant for navigation tasks stand out for their high scanning rates combined with high angular resolution.

Manufacturing and logistics processes can thus be organized with maximum efficiency. Thanks to the scanning frequency of up to 80 Hz, even fast-moving objects can be detected reliably. The integrated window monitoring supports predictive maintenance and ensures high system availability.

Thanks to its compact design, the laser scanners can also be integrated into confined production environments and small automated guided vehicles (AGVs).

ROD 300/500

- Maximum precision and attention to detail thanks to high angular resolution of up to 0.025°
- Detection of fast objects thanks to high scanning frequency of up to 80 Hz
- Predictive maintenance through window monitoring
- Outstanding integrability due to compact design
- Use in high and low temperature ranges
- Robust design with IP 67



Distance sensors

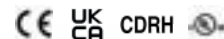
Optical distance sensors



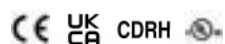
ODSL 8



ODS 9



Technical data	Measurement range	25 ... 45 mm 20 ... 200 mm 20 ... 500 mm	50 ... 100 mm 50 ... 200 mm 50 ... 450 mm 50 ... 650 mm 50 ... 1,050 mm
	Response time	2 ... 7 ms	1 ... 8 ms
	Resolution (type-dependent)	0.1 mm	0.01 mm
	Supply voltage U _B	18 V DC ... 30 V DC	10 V DC ... 30 V DC
	Light source	Laser, Red	Laser, Red
	Degree of protection	IP 67 IP 69K	IP 67
	Operational controls	Rotary switch	Control buttons LC Display PC software
	Display	LED	LED OLED display
	Housing	Metal, Diecast zinc	Plastic
	Dimensions without connector (W x H x D)	15 mm x 48 mm x 38 mm	21 mm x 50 mm x 50 mm
	Outputs	Analog output, Current Analog output, Voltage Digital switching output, Transistor, Push-pull	Analog output, Configurable, factory setting: current Digital switching output, Transistor, Push-pull
	Interface		IO-Link RS 232 RS 485
	Connection type	Connector, M12, Turning, 90°	Cable with connector, M12, Turning, 90° Connector, M12, Turning, 90°
	Optical distance measurement principle	Triangulation	Triangulation
	Type of scanning system	Against object	Against object
Features	Special version		Activation input Deactivation input Teach input
	Display for measured value display and configuration		X
	Ex marking acc. to EN 60079		
	Propagation time measurement (TOF)		
	Phase measurement		
	Triangulation measurement	X	X
	Supports the IO-Link smart sensor profile		X

**ODS 10****ODS 110****ODSL 30**

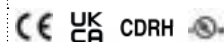
50 ... 8,000 mm, at 6 ... 90% diffuse reflection 100 ... 25,000 mm, In combination with cooperative target reflective tape 7-A	100 ... 3,000 mm, Factory setting of the analog output	200 ... 30,000 mm 200 ... 65,000 mm
3,4 ... 1000 ms, adjustable	4 ... 20 ms	30 ... 100 ms
1.0 mm	1.0 ... 5.0 mm	1.0 mm
18 V DC ... 30 V DC	18 V DC ... 30 V DC	10 V DC ... 30 V DC
Laser, Red	Laser, Red	Laser, Red
IP 67	IP 67 IP 69K	IP 67
Control buttons PC software	Control buttons PC software	LC Display Membrane keyboard
LED OLED display	LED	LC Display LED
Plastic	Plastic	Metal, Aluminum Metal, Diecast aluminum
25 mm x 65 mm x 55 mm	23 mm x 50 mm x 50 mm	79 mm x 69 mm x 150 mm 135 mm x 143 mm x 290 mm
Analog output, Configurable, factory setting: current Digital switching output, Transistor, Push-pull	Analog output, Current Analog output, Voltage Digital switching output, Transistor, Push-pull	Analog output, Voltage, Current Digital switching output, Transistor, Push-pull
IO-Link	IO-Link	RS 232 RS 485
Cable Cable with connector, M12, Turning, 90° Connector, M12, Turning, 90°	Connector, M12, Turning, 90°	Connector, M12
Time of flight	Time of flight	Phase measurement
Against object Against reflector	Against object	Against object
Activation input Deactivation input Teach input		Ex-protected
X		X
		X
X	X	
		X

Distance sensors

Optical distance sensors



ODSL 96B



Technical data	Measurement range	100 ... 600 mm 150 ... 800 mm 60 ... 2,000 mm 120 ... 1,400 mm 150 ... 1,200 mm 150 ... 1,500 mm 150 ... 2,000 mm 150 ... 2,300 mm 300 ... 10,000 mm 300 ... 25,000 mm
	Response time	1 ... 60 ms
	Resolution (type-dependent)	0.1 ... 0.5 mm
	Supply voltage U_B	10 V DC ... 30 V DC
	Light source	Laser, Infrared Laser, Red LED, Infrared LED, Red
	Degree of protection	IP 67 IP 69K
	Operational controls	Membrane keyboard PC software Teach button
	Display	LED OLED display
	Housing	Metal, Aluminum alloy Metal, Diecast zinc Plastic
	Dimensions without connector (W x H x D)	30 mm x 90 mm x 70 mm 150 mm x 150 mm x 124 mm
	Outputs	Analog output, Current Analog output, Voltage Digital switching output, Transistor, Push-pull
	Interface	IO-Link RS 232 RS 485
	Connection type	Cable Connector, M12
	Optical distance measurement principle	Time of flight Triangulation
	Type of scanning system	Against object Against reflector
Features	Special version	Ex-protected Extra long light spot (XL) Small light spot (S)
	Display for measured value display and configuration	X
	Ex marking acc. to EN 60079	X
	Propagation time measurement (TOF)	X
	Phase measurement	X
	Triangulation measurement	X

Distance sensors

Measuring ultrasonic sensors, cubic



420B series



Technical data	Dimensions without connector (W x H x D)	20.5 mm x 41 mm x 15 mm
	Measurement range	10 mm ... 1,000 mm
	Resolution	< 0.3 mm / < 0.5 mm
	Switching frequency	8 Hz ... 20 Hz
	Ultrasonic frequency	220 kHz ... 370 kHz
	Supply voltage U _B	12 V DC ... 30 V DC
	Switching outputs	Analog output, Current Analog output, Voltage Transistor, Push-pull
	Interface	IO-Link
	Connection type	Connector, M8
	Degree of protection	IP 67
	Operational controls	Teach button
	Housing	Plastic

Distance sensors

Technical data	Thread size
	Length
	Measurement range
	Resolution
	Switching frequency
	Ultrasonic frequency
	Supply voltage U _B
	Switching outputs
	Switching inputs
	Inputs/outputs selectable
	Interface
	Connection type
	Degree of protection
	Operational controls
	Housing
Features	Special version

Measuring ultrasonic sensors, cylindrical

NEW**200 series**

M18 M30
55 mm ... 78 mm
80 mm ... 6,000 mm
1.0 mm
2 Hz ... 5 Hz
80 kHz ... 200 kHz
18 V DC ... 30 V DC
Analog output, Current Analog output, Voltage Transistor, Push-pull
IO-Link
Connector, M12
IP 67
Metal
Multiplex operation Synchronous operation

300 series

M18 M30
60.3 mm ... 98.8 mm
40 mm ... 6,000 mm
5 mm 6 mm < 2 mm
1 Hz ... 10 Hz
75 kHz ... 300 kHz
10 V DC ... 30 V DC
Analog output, Current Analog output, Voltage Transistor, NPN Transistor, PNP
Teach input
1 Piece(s)
IO-Link
Connector, M12
IP 67
Control buttons
Plastic
Multiplex operation Synchronous operation Teach input

400 series

M12 M18 M30
50 mm ... 104.3 mm
15 mm ... 6,000 mm
0.1 ... 0.5 mm 1.0 mm < 0.3 mm / < 0.5 mm
1.6 Hz ... 12 Hz
75 kHz ... 310 kHz
12 V DC ... 30 V DC
Analog output, Current Analog output, Voltage Transistor, PNP Transistor, Push-pull
Teach input
1 Piece(s)
IO-Link
Connector, M12
IP 67 IP 68
Control buttons
Metal
Multiplex operation Synchronous operation Teach input

Sensors for positioning

Technical data	Measurement range
	Depth of field
	Interface
	Reproducibility (1 sigma)
	Resolution
	Max. traverse rate
	SIL
	Performance Level (PL)
	Error reaction time
	Degree of protection
	Light source
	Laser class
	Ambient temperature, operation (with / without heating)
	Dimensions without connector (W x H x D)
	Housing material
Features	Functions

Bar code positioning systems

**BPS 300i**

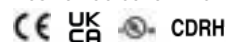
Various connection concepts

**FBPS 600i**

Reliable position output

**BPS 8**

Position detection in extremely compact design



10,000,000 mm	10,000,000 mm	10,000,000 mm
50 mm ... 170 mm	50 mm ... 170 mm	60 mm ... 140 mm
EtherCAT EtherNet IP PROFIBUS DP PROFINET RS 232 RS 422 RS 485 SSI	2-channel SSI with CRC 2-channel standard SSI PROFINET SSI	RS 232
0.05 mm	0.15 mm	1 mm
0.001 mm ... 10 mm	0.01 mm ... 1 mm	0.001 mm ... 100 mm
10 m/s	10 m/s	4 m/s
	3, EN 61508	
	e, ISO / EN ISO 13849-1 e, ISO / EN ISO 13849-1:2015	
	10 ms (configurable)	
IP 65	IP 65	IP 67
Laser, Red	Laser, Red	Laser, Red
1	1	2
-35 ... 50 °C -5 ... 50 °C	-35 ... 60 °C -5 ... 60 °C	0 ... 40 °C
100 mm x 108.7 mm x 48.3 mm	105 mm x 112.5 mm x 51.5 mm 116.3 mm x 112.5 mm x 51.5 mm	15 mm x 48 mm x 40.3 mm 51 mm x 61 mm x 17.4 mm
Diecast aluminum	Diecast aluminum	Diecast zinc
Heating	Heating Safe position detection Safe speed	

Sensors for positioning

Laser positioning systems



AMS 300i



AMS 100i



Technical data	Application	Collision protection of cranes / gantry cranes Positioning of electroplating plants Positioning of skillet systems and side-tracking skates Positioning of stacker cranes	Collision protection of cranes / gantry cranes Positioning of electroplating plants Positioning of skillet systems and side-tracking skates Positioning of stacker cranes
	Measurement range	200 ... 40,000 mm 200 ... 120,000 mm 200 ... 200,000 mm 200 ... 300,000 mm	100 ... 40,000 mm 100 ... 120,000 mm
	Interface	CANopen DeviceNet EtherCAT Ethernet EtherNet IP Interbus-S PROFIBUS DP PROFINET RS 232 RS 422 RS 485 SSI	EtherNet TCP/IP SSI
	Accuracy	2 mm 3 mm 5 mm	+/- 2 mm
	Reproducibility (3 sigma)	0.9 mm 1.5 mm 2.1 mm 3 mm	0.6 mm (with measurement range from 500 mm)
	Resolution, adjustable	0.001 ... 10 mm	0.001 ... 10 mm
	Supply voltage U _B	18 V DC ... 30 V DC	18 V DC ... 30 V DC
	Light source	Laser, Red	Laser, Red
	Laser class	2	2
	Light spot size / at sensor distance	40 mm / 40,000 mm 100 mm / 120,000 mm 150 mm / 200,000 mm 225 mm / 300,000 mm	40 mm / 40,000 mm 100 mm / 120,000 mm
	Degree of protection	IP 65	IP 65
	Operational controls	Membrane keyboard	Membrane keyboard
	Type of display	LC Display LED	LC Display LED
	Housing	Diecast zinc/aluminum	Diecast aluminum
Features	Optics cover	Glass	Glass
	Ambient temperature, operation (without / with heating)	-30 ... 50 °C -5 ... 50 °C	-30 ... 60 °C -5 ... 60 °C
	Dimensions without connector (W x H x D)	84 mm x 166.5 mm x 159 mm	70 mm x 139 mm x 118 mm
Features	Heating	X	X
	Interference-free when installed next to data transmission system DDLs	X	X

3D sensors / fork sensors

3D sensors



LPS 36, 36 HI, LES 36, 36 HI, LRS 36



Technical data	Application	3D object detection (LES & LRS) Contour measurement (LPS) Object measurement (LES & LPS)
	Inputs / outputs	Activation input Analog output Digital switching input Digital switching output
	Interface	Ethernet PROFIBUS DP
	Light source	Laser, Red
	Laser class	2M
	Detection range	200 ... 800 mm
	Resolution	1 ... 3 mm 0.1 ... 0.9 mm
	Measurement range	200 ... 600 mm 200 ... 800 mm
	Degree of protection	IP 67
	Supply voltage U_B	18 ... 30 V, DC
	Operational controls	Membrane keyboard
	Display	LC Display LED
Features	Dimensions without connector (W x H x D)	56 mm x 160 mm x 74 mm
	Special version	Plastic screen Synchronization input

3D sensors / fork sensors

Laser scanners

NEW



ROD 300/500



Technical data	Application	Container checking Contour measurement Navigation
	Measurement range	0.08 ... 25 m
	Detection angle	275 °
	Angular resolution	0.025° at 10 Hz 0.05° at 20 Hz 0.1° at 40 Hz 0.2° at 50 Hz 0.2° at 80 Hz
	Measurement time	12.5 ... 25 ms 12.5 ... 100 ms
	Measurement value resolution	2 mm
	Interface	Ethernet
	Light source	Laser, Infrared, 905 nm
	Laser class in accordance with IEC/EN 60825-1	1
	Connection	Connector, M12
	Dimensions without connector (W x H x D)	80 mm x 80 mm x 85 mm
	Housing material	Diecast zinc
	Lens cover material	Plastic
	Ambient temperature, operation	-30 ... 60 °C
	Degree of protection	IP 67
Features	Functions	Output of distance value and signal amplitude per angle segment
	Driver	ROS1 / ROS 2 driver

3D sensors / fork sensors

Measuring fork sensors



GS 754B



Technical data	Application	Detection of transparent objects Film detection > 0.1 mm
	Measurement field length	25 mm
	Mouth width	27 mm 98 mm
	Mouth depth	42 mm
	Inputs/outputs	Analog output, Current Analog output, Voltage Inputs/outputs selectable
	Interface	RS 232 RS 422
	Minimum object diameter	0.5 mm
	Reproducibility (1 sigma)	0 ... 0.03 mm
	Output cycle	0.012 s ... 3 s
	Response time	12 ms
	Light source	LED, Infrared
	Connection type	Connector, M12
	Degree of protection	IP 67
	Dimensions without connector (W x H x D)	19.4 mm x 82.1 mm x 91 mm 20.4 mm x 157 mm x 91 mm

Sensors for compartment fine positioning



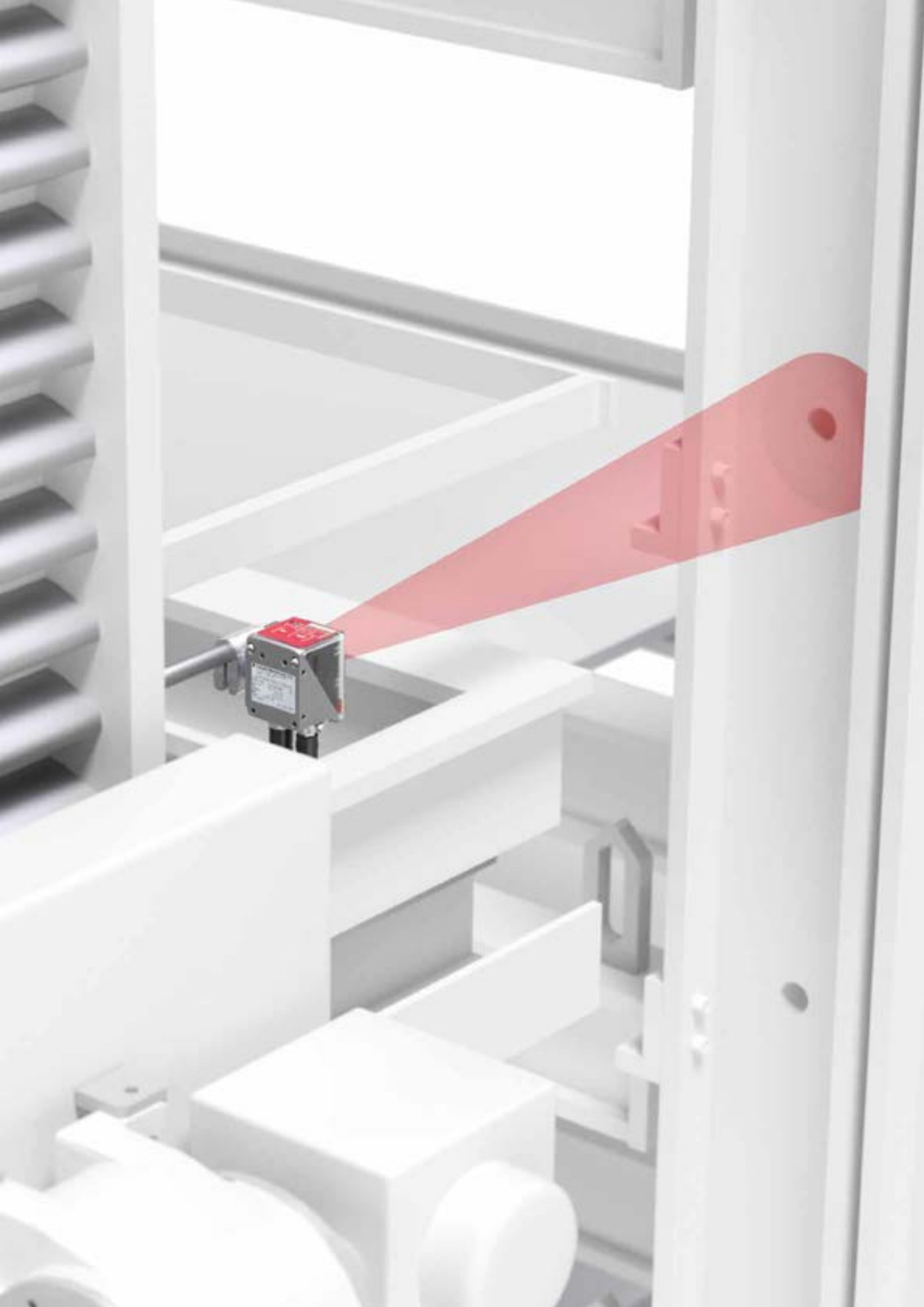
IPS 200i
Sensors for positioning



IPS 400i
Sensors for positioning



Technical data	Application	Single compartment depth	Double compartment depth
	Camera type	Monochrome	Monochrome
	Resolution (pixel)	1,280 px x 960 px	1,280 px x 960 px
	Marker size (round)	5 ... 15 mm 5 ... 20 mm	13 ... 15 mm
	Working range	50 mm ... 600 mm	250 mm ... 1,900 mm
	Reproducibility (1 sigma)	0.1 mm, depending on the application	0.2 mm, (Compartment depth 2: 0.5 mm) depending on the application
	Interface	Ethernet EtherNet IP PROFINET	Ethernet EtherNet IP PROFINET
	Switching outputs	5 Piece(s)	5 Piece(s)
	Switching inputs	3 Piece(s)	3 Piece(s)
	Light source	LED, Infrared	LED, Infrared
	Configuration/parametrization	Configuration codes Teach-in Via web browser	Configuration codes Teach-in Via web browser
	Supply voltage U _B	18 ... 30 V, DC	18 ... 30 V, DC
	Degree of protection	IP 65	IP 65
	Dimensions without connector (W x H x D)	43 mm x 61 mm x 44 mm	43 mm x 61 mm x 44 mm
Accessories	Mounting devices	BT 320M BTU 320M-D12	BT 320M BTU 320M-D12
	External illumination	IL AL	IL AL
	Reflectors	MTKZ	MTKZ
Features	Heating	X	X



Light curtains / volume measurement system

Technical data	Application
	Profile cross section
	Measurement field length
	Beam spacing
	Number of beams
	Operating range*
	Interface
	Outputs
	Supply voltage U _B
	Connection type
	Degree of protection
	Ex-zone
	Light source
	Housing
	Cycle time
	Response time per beam
	Operational controls
	Type of configuration
	Ambient temperature, operation
	Type of display
Features	Diagonal-beam scanning
	Crossed-beam scanning
	Parallel-beam scanning
	Ex-protected



CML 700i
Measuring



CML 720i EX
Measuring



CMS 700i
Measuring



Detection of transparent films Detection of transparent objects Object detection in film tube Object measurement Radiation of semi-transparent media	Object measurement	Evaluation of protrusions and deformations Measurement of height, length, width, orientation angle, object distance to the conveyor edge
29 mm x 35.4 mm 30.7 mm x 40.3 mm 30.7 mm x 54.8 mm 31 mm x 77 mm 31 mm x 117 mm	30.7 mm x 40.3 mm 30.7 mm x 54.8 mm	
150 mm ... 2,960 mm	130 mm ... 2,220 mm	
5 mm 10 mm 20 mm 40 mm	10 mm 20 mm	5 mm
7 Piece(s) ... 592 Piece(s)	7 Piece(s) ... 940 Piece(s)	
0.1 m ... 9.5 m	0.3 m ... 7 m	0.1 m ... 4.5 m
CANopen IO-Link PROFIBUS DP PROFINET RS 485 Modbus	CANopen IO-Link	EtherNet TCP/IP PROFINET
Analog output, Freely configurable Analog output, Voltage / Current		4x I/Os
18 V DC ... 30 V DC	18 V DC ... 30 V DC	100 V AC ... 263 V AC
Connector, M12	Connector, M12	Connector, M12 Earthing strap Harting connector Mains plug Screw fitting
IP 65 IP 67	IP 65	IP 54 (switch cabinet) IP 65 (light curtain)
	2 22	
LED, Infrared	LED, Infrared	LED, infrared
Metal	Metal	Metal
1 ms ... 18.16 ms	1 ms ... 7.12 ms	
10 µs ... 30 µs	30 µs	10 µs
Membrane keyboard	Membrane keyboard	Rotary switch
Software Teach-in	Software	performed via webConfig
-30 ... 60 °C	-30 ... 60 °C	0 ... 45 °C
LED OLED display	LED OLED display	LED
X	X	
X	X	
X	X	
	X	