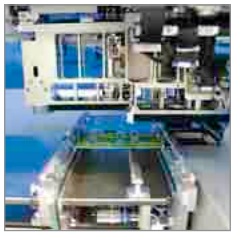
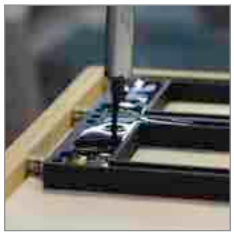
SENSORS IN ACTION

di-soric

Compact Catalog Solar

High-performance and competent





di-soric has successfully been involved in the application, support, development and production of standard and special sensors for industrial automation for more than 25 years.

Our family-run companies currently employ more than 180 members of staff at two sites. The company headquarters are located in Urbach, east of Stuttgart, while our development and production site is in Lüdenscheid, south of Dortmund.

Thousands of customers rely on **di-soric** products in Germany alone, and several thousand more world-wide.

Our customer base includes small and medium-sized companies as well as international corporate groups and numerous car manufacturers.

Our products have unique selling points which are of great use to our customers, particularly the very well-known fork light barriers, which were invented by us more than 20 years ago and are continuously being further developed.

Our proximity to our customers and continuous market analysis enable us to detect and respond consistently to new or changed product requirements.

This has led to the development of special sensors for presence or edge inspection as well as double layer and fragment detection during the polishing of raw wafers.

Due to the extremely wide range of uses and environments, special demands are made of all sensors used in the process.

Sensors developed for this area of application have a robust casing and are characterised by an especially high functional reserve, e.g. for penetrating wafer plates up to 300 µm thick.

For requirements in wet areas we offer light curtains in a special casing with the especially high protection class IP 69K.

In addition to the stated standard and special requirements, we will be pleased to assist and work with you to meet your needs with solutions developed, manufactured and implemented in the shortest possible time.

This compact catalogue contains an overview of the most commonly used sensors in the manufacture of wafers for photovoltaic systems.

We will be happy to provide personal, on-site advice.

Use our experience.

Your **di-soric** team

Sales, warehouse and administration in Urbach

Development and production in Lüdenscheid

Tailor-made sensors for **wafer handling**

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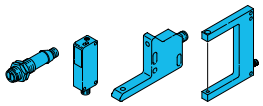
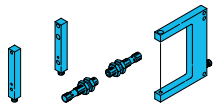
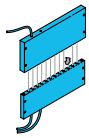
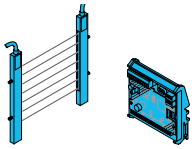
	**Presence detection** Diffuse sensors Diffuse sensors with background suppression Fork-/ angled light barriers	04 – 05
	**Double layer detection** High performance photoelectric sensors	06 – 07
	**Fragment detection** High performance light curtains	08 – 09
	**Edge chipping detection** **Jam detection in wet areas** Measuring light curtains / Evaluation electronics	10 – 11

International Sales Network

Europe
Asia
Australia
North America
South America
Africa

Wafer presence detection

di-soric sensors with different casing designs and operating principles are used for a large number of applications in automated wafer manufacturing.

Light sensors are available with background suppression e.g. to detect the presence of wafers in transport boxes, as well as light sensors for short-range operation. Fork light barriers with dirt-resistant lens optics and angled fork light barriers with contamination indicators for detection on conveyors round the programme off. The essential feature common to all versions is reliable and exact wafer detection.

Diffuse sensor
OT 6-18 …

- Background-independent short-range wafer detection
- Connector M12
- Infrared light, clocked
- Sensitivity adjustable
- LED indicatior for output state
- Robust plastic casing
- High protection class

Precision laser sensor
LHT 81 …

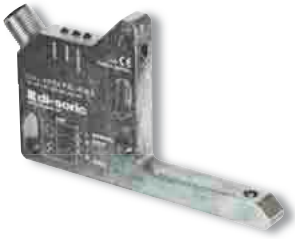
- Background suppression for wafer presence detection in transport boxes
- Vibration-safe 6-turn adjustment for finest adjustment
- Red light laser, clocked, with small laser spot
- High resolution, switching accuracy and switching frequency
- Functional reserve indicator / contamination indicator
- Robust metal casing
- High protection class

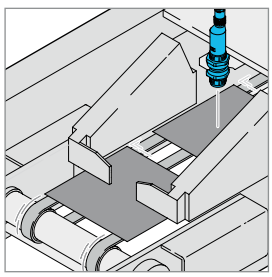
Fork light barrier
OGUFIX 121/125…

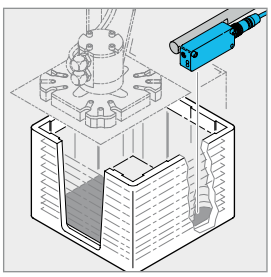
- Dirt-resistant lens optics
- Quick commissioning, no adjustment elements
- Mountable side by side
- Robust metal casing
- High protection class

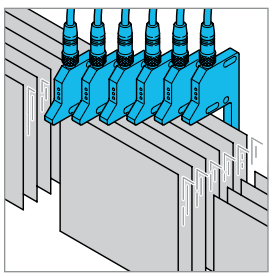
High performance angled light barriers
OGL 55/54…

- Intelligent contamination output with LED
- Optical axis approachable in x-, y- and z-direction
- Robust metal casing
- High protection class









CE

Technical data (typ.)	+20 °C, 24 V DC
Service voltage	10 … 35 V DC
	10 … 30 V DC (OT 6-18 K 65 P3-B4)
Ambient temperature	–10 … +60 °C
	–20 … +60 °C (OxP 12 …/ OGUP 120/130 …)
	–25 … +50 °C (OT 6-18 K 65 P3-B4)
Protection class	IP 67
	IP 66 (OT 6-18 K 65 P3-B4)

	Wafer presence detection	Sensing range/fork width/ journal length (mm)	Size (mm)	Output	Operating frequency (Hz)	Red light	Infrared light	Red light laser, clocked	Internal power consumption (mA)	Casing material	Connector	Connecting cable	
Diffuse sensors													**Purchase order table***
	■		10 … 65	M18	pnp, 100 mA, NO/NC	333		■		30	ABS	M12	VK … /4	**OT 6-18 K 65 P3-B4**
Precision laser sensor with background suppression													
	■		40 … 400	76 x 30 x 18	Push pull, 200 mA, NO/NC	1.000			■	30	Die-cast zinc	M12	VK … /4	**LHT 81 M 400 G4L-IBS**
Fork light barrier													
	■		120	144 x 155 x 12	pnp, 200 mA, NO/NC	2.000	■			40	Aluminium	M8	TK …	**OGUFIX 121/125 P3K-TSSL-180L**
High performance angled light barriers													
	■		55/54	65 x 106 x 10	pnp, 200 mA, NO	200	■			45	Die-cast zinc	M12	VK … /4	**OGL 55/54 P6L-IBS**
						100		■						**OGL 55/54-0 P6L-IBS**
	■		55/54	65 x 106 x 10	pnp, 200 mA, NO	200	■			45	Die-cast zinc	M12	VK … /4	**OGL 55/54 P6L-RIBS**
						100		■						**OGL 55/54-0 P6L-RIBS**

* Excerpt from delivery programme

Double layer wafer detection

di-soric high performance photoelectric sensors are especially designed for wafer detection. The unique operating principle means that double layers of wafers are reliably detected during manufacture and transport. These sensors are available in different casing designs for installation in differently sized spaces.

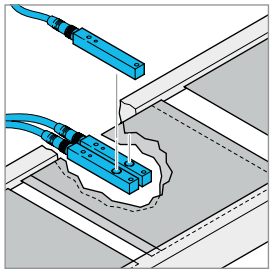
- Double layer wafer detection
- Wafer presence detection
- For wafers up to 300 µm thick
- Reliable fade-out of reflection and contamination

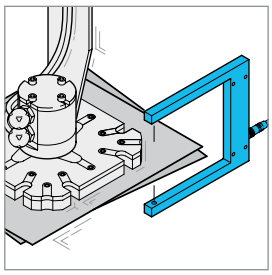
High performance through beam sensors
OSPx … / OEPx …

- Two different receivers for presence and double layer detection
- High protection class for wet areas
- Robust metal casing

High performance fork light barriers
OGUP 120/130 …

- Adjustable transmit power
- High protection class for wet areas
- Robust metal casing





CE

Technical data (typ.)	+20 °C, 24 V DC
Service voltage	10 … 35 V DC
Ambient temperature	–10 … +60 °C
	–20 … +60 °C (OxP 12 …/ OGUP 120/130 …)
Protection class	IP 67
	IP 67, IP 68, IP 69K (OxP 12 …)

	Wafer presence detection	Double layer wafer detection	Fork opening/journal length (mm)	Size (mm)	Transmitter (S) / Receiver (E)	Output	Operating frequency (Hz)	Red light	Infrared light	Internal power consumption (mA)	Casing material	Connector	Connecting cable	
High performance through beam sensors														**Purchase order table***
	■	■	–	M12 x 75	S	–	–	–	■	55	Stainless steel/ V2A	M12	VK …	**OSP 1-12 VHF-IBSL**
	■		–	M12 x 75	E	Push pull, 200 mA, **NC**	500	–		40				**OEP 12 V 5000 G1-IBSL**
		■					20							**OEP 12 V 50000 G1-IBSL**
	■		–	M12 x 75	E	Push pull, 200 mA, **NO**	500	–		40				**OEP 12 V 5000 G2-IBSL**
		■					20							**OEP 12 V 50000 G2-IBSL**
	■	■		12 x 12 x 91	S		–	–	■	55	Stainless steel/ V2A	M8	TK …	**OSPQ 12 MLF-TSSL**
	■		–	12 x 12 x 91	E	Push pull, 200 mA, **NC**	500	–		40				**OEPQ 12 M 5000 G1-TSSL**
		■					20							**OEPQ 12 M 50000 G1-TSSL**
	■		–	12 x 12 x 91	E	Push pull, 200 mA, **NO**	500	–		40				**OEPQ 12 M 5000 G2-TSSL**
		■					20							**OEPQ 12 M 50000 G2-TSSL**
	Functional module for OSP 12 … / OSPQ 12 …													
			For adjusting the transmit power and activating the test function									M8	TK …	**FM 70-1-TS**
												M12	VK …	**FM 70-1-BS**
			For adjusting the transmit power									M8	TK …	**FM 70-2-TS**
												M12	VK …	**FM 70-2-BS**
High performance fork light barriers														
	■	■	120	144 x 160 x 12		Push pull, 200 mA, NC, pnp / NO, npn	20	–	■	50	Aluminium	M8	TK …	**OGUP 120/130 G1K-TSSL**
	■	■	120	144 x 160 x 12		Push pull, 200 mA, NC,npn / NO, pnp	20	–	■	50	Aluminium	M8	TK …	**OGUP 120/130 G2K-TSSL**

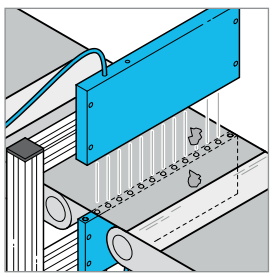
* Excerpt from delivery programme

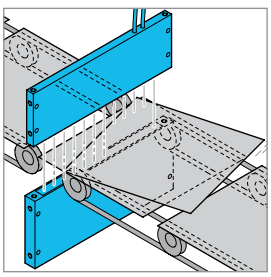
Wafer fragment detection

Reliable fragment detection.
di-soric high performance light curtains are used to reliably detect silicon fragments on wafers. Early ejection of these defective wafers from the manufacturing process reduces the reject rate. Thanks to the compact dimensions, these light curtains are suitable for mounting in narrow spaces.

High performance light curtains
OLGxP 12/12 …

- Electronic potentiometer for adjusting wafer thickness and fragment size
- Input for switching between wafer sizes 125 mm and 156 mm
- Small size for mounting between two belts
- Metal casing
- High protection class





CE

Technical data (typ.)	+20 °C, 24 V DC
Service voltage	24 V DC, ± 10%
Internal power consumption	130 mA (OLGSP …)
	150 mA (OLGEP …)
Operating output	Push pull, 200 mA, NO (OLGEP …)
	Short-circuit-proof, polarity-safe
Voltage drop	< 2,0 V (OLGEP …)
Working distance	≤ 50 mm transmitter / receiver (recommended) [1]
Detection width	156 / 125 mm switchable via Pin selection „detection widths"
	(0V = 156 mm detection width, 24V = 125 mm detection width)
Penetrable wafer thickness	≤300 µm (mono poly-crystalline silicium wafer material)
Objekt resolution	≥ 15 mm large fragments as double layer on standard wafers
System response time	20 ms, incl. suppression of electronic wafer edge wrong pulses
Transmit power	0…100 % digitally adjustable (OLGSP …)
Transmit power	Infrared light, clocked
Ambient temperature	+ 5 ... + 40°C
Protection class	IP 67
Casing material	Aluminium, black anodized
Dimensions	55 x 166 x 8 mm (OLGSP …)
	70 x 166 x 12 mm (OLGEP …)
Indicators	
LED, green	Operating
LED, yellow	Switching output (OLGEP …)

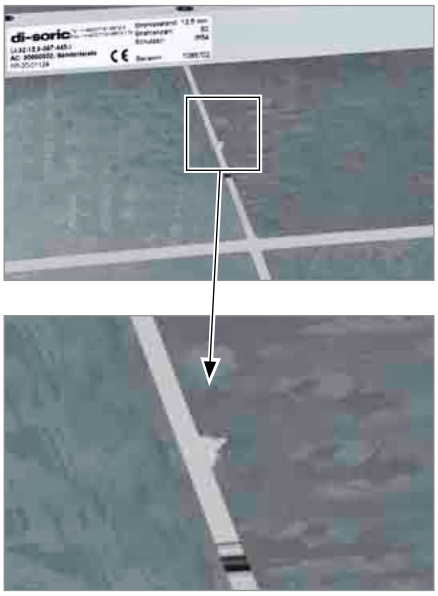
Purchase order table*	Model
Transmitter	**OLGSP 12/12 M 50 D-K2.5-TS**
Receiver	**OLGEP 12/12 M 50 G2-K2.5-TS**

[1] Larger distances are possible and depending on the wafer and can be determined by a test.

Wafer edge chipping detection

Reliable detection of the smallest fragments! Measuring light curtains from **di-soric** are used to monitor fragments or detect defective wafers in single- or multi-lane conveyors. By means of diagonal beam evaluation and interpolation, chipping in silicon wafers can be reliably detected on all four sides from a size of 1,5 mm.

Reliable wafer detection in wet areas!
Group evaluation of multiple light beams enables reliable wafer detection. Versions with protection class IP 68 / IP 69K can be used in wet areas.

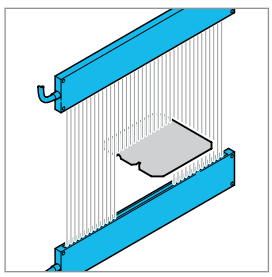


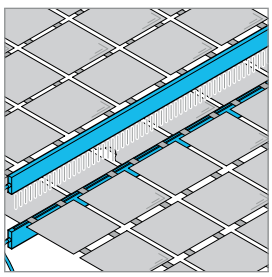
Measuring light curtains with evaluation electronics LVE … / LVX …

- Compact design
- Aluminium casing
- Simple mounting
- Special protection for protection class IP 69K optionally

Evaluation electronics for light curtains of series LI …

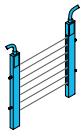
- Evaluation electronics for 1 or 2 light curtains LI …
- Interfaces:
  1 input for which parameters can be set,
  3 combined inputs/outputs,
  3 outputs, RS 232, CANopen
- Diagnosis LEDs
- Parameters for functions can be freely assigned
- Fitted on DIN rail

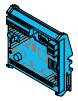




CE

Technical data (typ.)	+20 °C, 24 V DC
Operating distance	0,25 … 6,0 m, adjustable
Number of light beams	max. 500
Service voltage	20 … 26 V DC
Contact rating	250 mA
Output function	Parametrizable
Light beam evaluation	Parameters can be assigned horizontally / diagonally
Cycle time per light beam	0,05 ms depending on configuration and range of the light bars
Ambient temperature	-20 … 40 °C (light curtains)
	0 … 40 °C (evaluation electronics)
Protection class	IP 54 (light curtains)
	IP 00 (evaluation electronics)
Protection degree	III, Operation on protective low voltage
Casing material	Aluminium nature (light curtains)
	Plastics (evaluation electronics)

	Light curtains of series LI …	Light beam interspace (mm)	Number of beams with horizontal beam evaluation	Number of beams with diagonal beam evaluation	Number of evaluable beams	Resolution with diagonal beam evaluation interpolatable up to (mm)	Monitored height H (mm)	Profile length L approx. (mm)	Number of light curtains	Inputs for which parameters can be set (24 V DC, 12 mA, 3000 Hz)	Inputs/outputs	Outputs (24 V DC, 0.25 A, PNP)	3 combined IOs	RS 232	Assignment of parameters using DIP series	CANopen interface	D-Sub, 9-pin Profibus interface (address can be set)	Dimensions L x W x H (mm)	Purchase order table*
		5	40	79	–	1,5	195	230	–	–	–	–						58 x 12 x 230	**LI 40–5–195–230 T**
		5	48	95	–	1,5	235	270	–	–	–	–						58 x 12 x 270	**LI 48–5–235–270 T**
		5	192	383	–	1,5	955	990	–	–	–	–						58 x 12 x 990	**LI 192–5–955–990 T**
		5	296	591	–	1,5	1475	1510	–	–	–	–						58 x 12 x 1510	**LI 296–5–1475–1510 T**
		50	16	31	–	25	750	840	–	–	–	–						24 x 12 x 840	**LI 16–50–750–840 I**

	Evaluation electronics for light curtains of series LI …																	
	–	–	–	until 500	–	–	–	1	1	1	1	■	■	■			88 x 126 x 60	**LVE** [1]
	–	–	–	until 600	–	–	–											**LVE-FVS** [1]
	–	–	–	until 500	–	–	–	1	1	1	1	■	■	■		■	163 x 126 x 60	**LVE-PBI** [1]
	–	–	–	until 600	–	–	–											**LVE-PBI-FVS** [1]
	–	–	–	until 500	–	–	–	2	1	3	3	■	■	■	■		125 x 126 x 60	**LVX** [1]
																■	200 x 126 x 60	**LVX-PBI** [1]

***** Excerpt from delivery programme

[1] The selection electronics are configured in the factory using the customer application.

Further information and types will be found under **www.di-soric.com**

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